What does the Avaya deal mean?

The sale of Avaya is just the latest in a string of private-equity technology buyouts that just might not mean good things for customers. **PAGE 6.**

Test: E-mail archiving software

NETWORKWORLD CLEAR CHOICE

Symantec's Enterprise Vault finds what you're looking for. **PAGE 27.**

VoIP migration lessons

How Northwestern University made the leap from TDM to IP PBXs.
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NETWORKWORLD

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June 11, 2007 ■ Volume 24, Number 23

WHICH IS BETTER FOR YOUR DATA CENTER: BLADES OR RACKS?

BY TOM HENDERSON AND RAND DVORAK, NETWORK WORLD LAB ALLIANCE

In the world of data center computing, there's a lot of contention over whether deploying rackable servers is better than deploying blade servers to host consolidated or virtualized applications.

Because IBM has been a top performer in recent server tests, for this hands-on exploration of blades vs. rackable servers, we tested IBM's state of the art in both categories — the HS21 and HS21 XM blades and the x3550 and x3650 rackables — and focused on performance, power consumption and manageability.

NEWSPAPER ■ $5.00

Net management tools lacking IPv6 features

BY CAROLYN DUFFY MARSAN

When it comes to network management software that supports IPv6, buyers should be wary.

An increasing number of network monitoring and management tools support IPv6, but these products often don't include the full set of features available in IPv4. And few commercial offerings provide the extra capabilities needed for IPv6, an upgrade to the Internet's primary protocol that has a new addressing scheme, built-in autoconfiguration and end-to-end security, among other features.

It's unclear whether enough IPv6-ready network management functions will be available by June 2008, when U.S. federal agencies are required to turn on IPv6 support in their backbone networks.

"We deployed IPv6 many years ago, and from a network-centric point of view, there are still some basic things that aren't there yet," says Rick Summerhill, director of network research, architecture and technologies for Internet2, a next-generation network run by a consortium of U.S. universities.

"We rely on [Cisco] NetFlow to analyze what goes on in our network, and that isn't there yet for IPv6. It's little things, like being able to do usage on our interface," Summerhill says, pointing out that both routers and network management software are missing key features. "The ability to analyze your network in some way — that's what's still missing."

Summerhill says this gap in the ability of network

See Management, page 33

Vista not playing smoothly with IPv6

BY CAROLYN DUFFY MARSAN

Early adopters of Microsoft's Vista operating system are reporting problems with its implementation of IPv6, a long-anticipated upgrade to the Internet's primary protocol.

IPv6 supports a 128-bit addressing scheme, which lets it support an order-of-magnitude more devices that are directly connected to the Internet than its

See Vista, page 15

Will 802.11n mean fast trouble for IT?

BY JOHN COX

BURNING QUESTIONS: Wireless

First of two parts.

Wireless networks might be mainstream across the enterprise, but that doesn't mean they're no-brainers. Here we raise and attempt to answer some of the thornier questions you still might be dealing with.

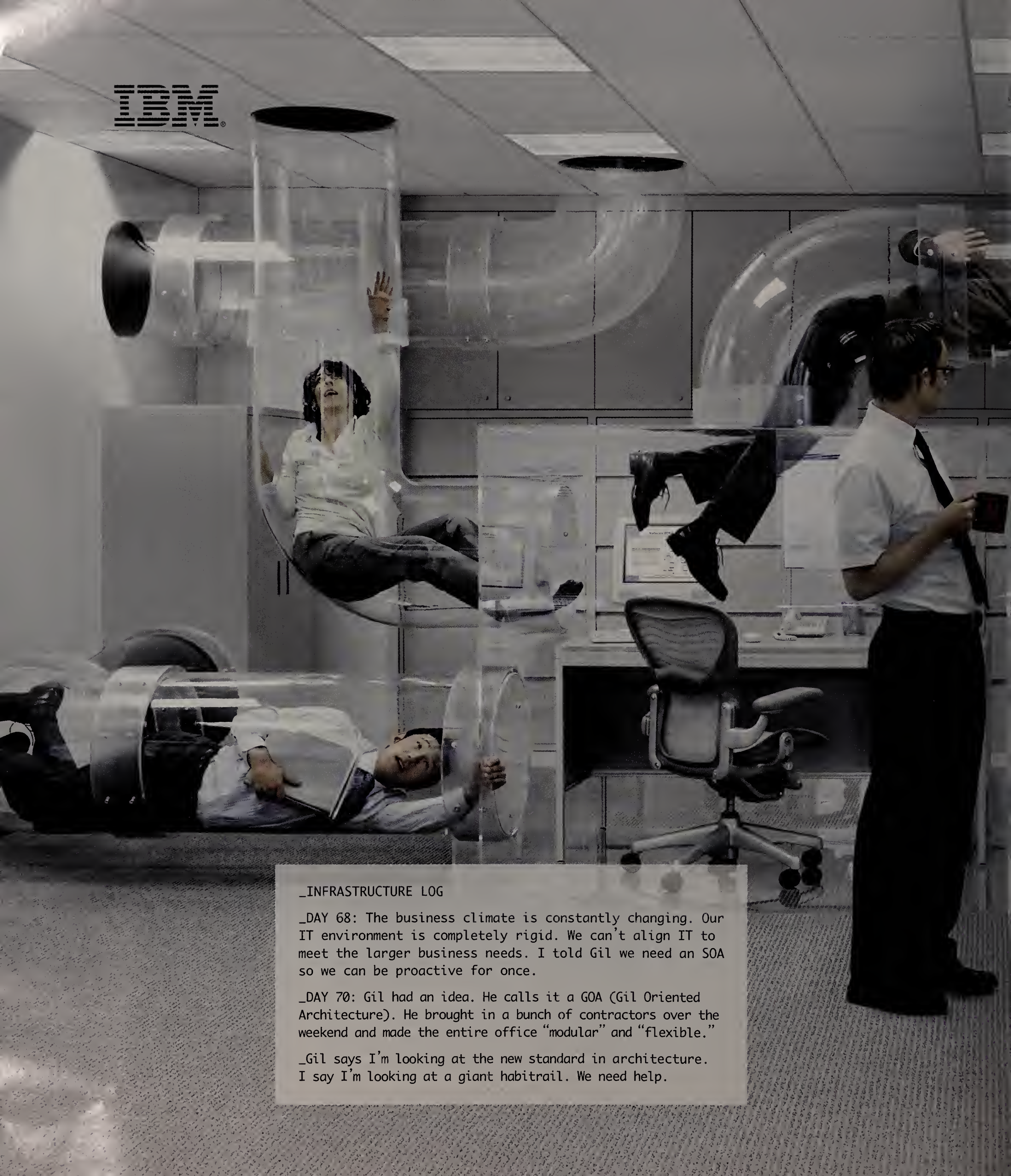
How will high-throughput 802.11n wireless LANs affect the corporate network?

A surprising number of WLAN vendors recently have announced enterprise access points based on the draft IEEE 802.11n standard that promise 100M to 200Mbps throughput per frequency band — three to six times the throughput of today's 802.11g and 802.11a networks.

Whether network managers opt for the draft 11n products, certified interoperable by the Wi-Fi Alliance, or wait for the final IEEE ratification in late 2008 or early 2009, they could face any of these four issues: overloading part of the wired infrastructure; overloading existing, older WLAN switches; forcing an upgrade to higher-powered Power over Ethernet (PoE); and repositioning and rewiring some existing wireless access points.

Most of the new access points will come with one or two Gigabit Ethernet ports. "We're mostly 100 meg to our buildings," says Michael Dickson, network analyst at the University of Massachusetts at Amherst. "[For 11n], we'll need gigabit switches in the closet with 10-gigabit uplinks. That's a definite

See Wireless, page 10


IBM

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Network Infrastructure

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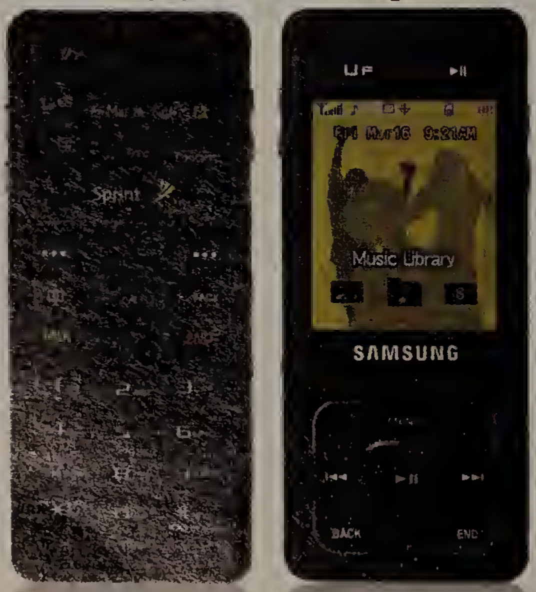
COOLTOOLS

Samsung's UpStage features a phone on one side and a music player on the other. Page 18.



Clear Choice Test: E-mail archiving software

Symantec's Enterprise Vault finds what you're looking for. **Page 27.**

Newsbits

Critical Windows fixes this week

■ Microsoft will release six sets of security patches Tuesday, four of which will fix critical flaws in Windows. The software will be released as part of Microsoft's regular monthly security release. Microsoft also is planning less-critical updates for Visio and Windows Vista, the company says. The critical Windows updates fix flaws in Internet Explorer, Outlook Express, Windows Mail and other core components of the operating system. Microsoft considers an update critical when the flaw could be used by an attacker to run unauthorized software on the victim's machine remotely, theoretically leading to the propagation of an Internet worm. Microsoft is slightly ahead of its 2006 patch rate. By June 2006, the company had released 32 security updates. With these six updates, the June 2006 tally will be 35.

CEO: Xandros doesn't violate patents

■ Xandros CEO Andreas Typaldos said last week his company did not agree that its Linux distribution violates any Microsoft patents, nor did the software giant ask Xandros to do so as part of the patent cross-licensing deal the two recently signed. But he said feedback from the Linux community has been on the order of "you shouldn't really be talking to the devil." Typaldos told *Network World* that at no time did Microsoft reveal to Xandros (which develops Linux desktops, servers and management tools) any of the 235 patents that Microsoft says Linux violates. Microsoft has yet to detail publicly the specific patents violated by Linux, and some critics think the statement is a smokescreen to undermine the open source community. "We did not discuss patents [with Microsoft] and we don't think Linux violates any patents, and we were not asked about it," Typaldos said. "It is a nonissue for us."

Ex-Alcatel exec pleads guilty

■ A former Alcatel executive has pleaded guilty to paying more than $2.5 million in bribes to secure a telephone contract with Costa Rica's state telecommunications agency, the U.S. Department of Justice said last week. Christian Sapsizian pleaded guilty to charges of conspiracy and violating the U.S. Foreign Corrupt Practices Act at the U.S. district court in Miami. He is set to be sentenced Dec. 20 and faces a maximum of 10 years in prison and $580,000 in fines. The Justice Department says Sapsizian admitted to paying the bribes to a director at Costa Rica's Instituto Costarricense de Electricidad, to secure mobile-phone contracts for his company. Alcatel eventually was awarded a $149 million mobile-phone contract in August 2001, the department said.

TheGoodTheBadTheUgly

< Bono bails out Palm. Palm's financial future looked a little more secure as private-equity firm Elevation Partners said it will pump $325 million into the mobile-device manufacturer. Elevation is a $1.9 billion private-equity firm, and one of its five partners is Bono, the lead singer of Irish rock band U2. The investment in Palm is by far the largest the firm has ever made.

What e-discovery rules? Under the Federal Rules for Civil Procedure that took effect Dec. 1, 2006, businesses have to have policies in place on how they will produce electronic documents they hold in the event of a federal court lawsuit. But Xiotech, a vendor of file-management technology, said that in a survey of 166 businesses conducted in March and April, only 39% said they had a system in place for document "holds," that is, demands that they protect important information from being deleted. Less than 25% said they had taken steps to comply with the new rules.

Google fingers Microsoft Web software Must be breaking Google's hearts to report this finding: Web sites running Microsoft's Web server software are twice as likely to be hosting malicious code as other Web sites. Last month, Google's antimalware team looked at 70,000 domains that were either distributing malware or hosting attack code, and made the finding.

Study: Data-breach lessons ignored

■ While 78% of large companies say their databases are "critical" or "important" to their business, 40% don't monitor them for security purposes. Those are the primary results of a Ponemon Institute research study released last week that surveyed 649 IT executives. Fifty-seven percent of the executives surveyed admitted their organizations haven't taken "adequate measures" to protect against malicious insiders, and 55% acknowledged they had no adequate measures in place to prevent data loss. Eighty percent of the executives surveyed said their organizations have more than 100 databases, primarily multiplatform environments including Microsoft SQL, Oracle and IBM DB2. The most critical priorities the IT executives cited for this year were upgrading existing applications, consolidating IT and improving efficiency.

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Avaya buyout comes with plenty of risk

Private equity firms seek quick profits, diminishing focus on products

BY TIM GREENE AND PHIL HOCHMUTH

The sale of Avaya is the latest in an increasing number of private equity buyouts of technology companies that might not be good things for customers.

The $8.2 billion deal announced last week will take the company private and likely come with financial burdens that could sap the market-leading seller of corporate telecom gear of money needed to keep the company's edge, experts say.

"When private equity shows up it's more about financial engineering than it is about sort of products and synergies and those sorts of things," says Samuel Wilson, an analyst with JMP Securities.

"Typically these deals load the company up with debt with significant restraints on operations and cash flow and demands for a better output," says Francis McInerney, managing director of North River Ventures. "Technology development falls off because cash flow goes somewhere else."

Over the past year, private equity firms seem to be buying up more technology companies, such as Avaya, Agilent Technologies, Alltel, First Data, CDW, Acxiom and Primax Electronics to name a few.

The good news is that if things do go awry, they usually happen slowly and they don't send products or services into a tailspin. "It could be slow at first. It could be imperceptible," McInerney says.

Technology companies are regarded as iffy investments because the products and the markets are so complex, experts say. But with an abundance of money to invest, the equity firms are willing to take more risks, he says. "It shows desperation on private equity's part looking for deals, and at some point you run out of the deals private equity ideally looks for," McInerney says.

That fact pushes the equity firms to take risks that more conservative investors would avoid. "It doesn't surprise me," Wilson says. "In this market, with private equity, nothing that they do surprises me. They're sort of willing to do anything."

Technology buys require specialized business talents, he says. "You'd better know what you're doing, because these businesses can have enormous operational problems. It's not like you're buying something that pumps oil and there's always going to be a market for oil."

Once tech firms are taken private, the goal for investors is to make money on the deal quickly, McInerney says. "Have you seen the show 'Flip This House'"? It's like that," he says.

What equity firms do can vary, and it's more difficult to track because the company becomes private and is no longer subject to public stockholder scrutiny. "There are things they can do out of the public eye, which is true — big public companies have a hard time doing," Wilson says. "They can sort of clean it up, jazz it up, maybe do an acquisition or two, then maybe bring the company back public again."

The problem with that is sometimes what the companies need to gain value falls into areas where equity firms are weak, McInerney says. "The problem with private equity guys as a rule is that very few of them have run businesses," he says. "Most have never had profit and loss themselves, and there's not a lot of operational expertise."

In the case of Avaya, for example, McInerney believes the company needs to shorten the time it takes for customers to pay for gear once they've received it. That generally indicates that the vendor isn't doing enough for its customers, but addressing the problem can take many forms.

For instance, the problem might be with products, sales teams and management of major accounts. Solving the problem requires nuts-and-bolts business analysis and reform. "I just don't see how private equity could solve that," he says. ■

Equity firms like tech

Recently, private equity firms have shown more interest in snapping up technology companies — traditionally a higher-risk business sector than these investors like to dabble in.

Date	Company bought	Buyer	Amount
6/4/07	Avaya	TPG Capital and Silver Lake Partners	$8.2 billion
5/30/07	CDW	Madison Dearborn Partners	$7.3 billion
5/21/07	Alltel	Goldman Sachs and TPG Capital	$27.5 billion
5/16/07	Acxiom	Silver Lake Partners and ValueAct Capital	$3 billion
4/17/07	Primax Electronics	Hong Chuan Investment	$250 million
4/5/07	First Data Corp.	Kohlberg, Kravis, Roberts & Co.	$29 billion

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What Avaya going private means to you

Company says it will be more nimble; drastic change not expected near-term

FAQ

BY PHIL HOCHMUTH

Here's what Avaya going private means to users of its technology, and the market.

Why would Avaya want to go private?

Analysts say the move was good business. Avaya's stock price grew 28% from the time rumors began of a buyout deal two weeks ago. Overall, Avaya's stock at the time of the sale was up around 40% since April.

"[Avaya] is just trying to figure out what would bring the most value for their shareholders," says Samuel Wilson, an analyst with JMP Securities.

"One of the problems that [Avaya] has chronically had is no sex appeal," Wilson says. "That's kind of how investors have always thought about it — it's no fun."

How would a private equity buyout affect users?

Organizations with heavy investments in Avaya say they are not concerned about near-term consequences of a buyout. But long-term plans may hinge on what happens to the firm if it decides to do a makeover of itself under private equity management.

"I wouldn't anticipate any short-term changes because the Avaya product line is so strong," says Scott Mah, assistant vice president for IT infrastructure at the University of Washington in Seattle, a large Avaya shop. A major TDM product end-of-life or a strategic refocus on Avaya's part could mean the organizations would go with another provider of both TDM and VoIP technology. "It's something we'll have to do due diligence on" if something does happen, he says.

What plans do the private equity buyers have for Avaya?

While the company will be run differently under private ownership, Avaya COO Michael Thurk says drastic changes are unlikely.

"What both Silver Lake and TPG have conveyed to us [is that] they look into the technology industry for companies that have strong propositions with their customer base and their product lines," Thurk says. "They're very committed to supporting our continued growth and providing long-term opportunities for the employees, as well as opportunities for new product lines for our customers."

What could change inside Avaya?

Thurk says the company will be more nimble under private ownership, which will help it serve customers.

"We think the company has an opportunity to be even more responsive to our customers, to act quite quickly and responsively with respect to actions we can take within the company," he says. "There are times, for example, [where] investments can be made in a private environment for the long term that are more difficult to do when under quarter-to-quarter pressures" as a public company.

By going private, JMP's Wilson says, Avaya could "do some things out of the public eye" to revamp itself as a more streamlined, appealing company for investors. Slashing the company's legacy TDM business or selling it off is one potential move.

"They're supporting two product lines — legacy TDM products and next-generation IP products," Wilson says. "They need to ramp down all support, and end-of-life the TDM stuff and focus on purely on IP." ■


Gateway
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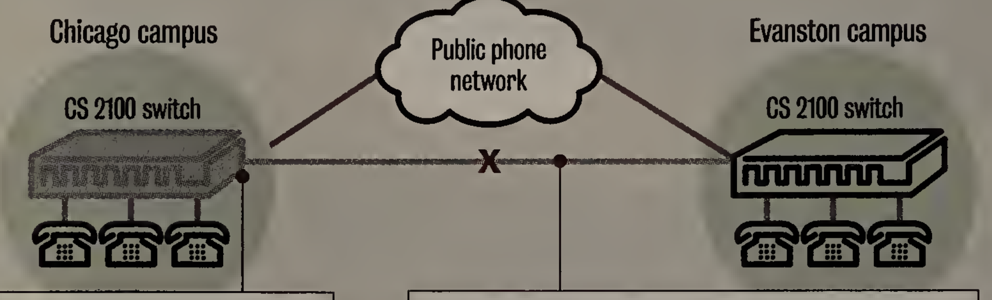
Northwestern eases into VoIP

BY TIM GREENE

How to keep a VoIP net from failing

Northwestern University's VoIP CS 2100 switches from Nortel can keep the campus phones running if either fails or if connections between the Chicago and Evanston, Ill., campuses go down.



If the Chicago switch goes down, the one in Evanston can handle all the switching for both campuses, including PBX extension dialing.

If trunks between campuses break, each switch can act independently to complete calls generated locally. Extension dialing between campuses would be lost, but each switch could call to the other campus using the public phone network.

Northwestern University is getting rid of its old TDM phone switches, not in response to a groundswell of demand for communications options unique to its new VoIP system, but to be ready for the day when that groundswell hits.

"In some sense we are buying potential," says David Carr, director of telecommunications and networking for Northwestern, about the move to Nortel VoIP switches.

Most of the university's 18,000 phone users on two campuses say they'd be happy with phone service just as it is, according to a poll by Carr. Others are ready to embrace VoIP, but for a limited set of features that can help them do their jobs better right away.

The new capabilities include mobility and presence integrated with applications, but Carr says users weren't looking for a specific application.

As part of the VoIP project, which started in 2003 with a review of ways to upgrade two Nortel SL 100 phone switches, the university discovered it needed to upgrade its wiring closets, stress-test its network, address QoS and consider network admission control. "They all get wrapped together," Carr says.

The two carrier-grade SL-100 phone switches, one at the university's Chicago campus and one at its campus in Evanston, Ill., were about 20 years old.

The goal was to collapse the two separate switches into a single logical switch to reduce management complexity, he says. The school also didn't want to replace all its digital phones at once.

It decided to upgrade to the Nortel CS 2100 VoIP switch, which supports both VoIP and TDM, so users would not be forced to switch their handsets for VoIP phones. "Those who wanted to take advantage of the VoIP value proposition could do so, and those that were happy continuing to use their current telephony features and services could do so. It allowed the community to migrate at its own pace," Carr says.

The university has installed a CS 100 at the Chicago campus and expects to have one installed at the Evanston campus next month. Until then the school has 250 IP phones working on a trial basis. "Beyond that we're waiting until we finish these upgrades," he says.

The university is keeping the line side of the TDM switches that the twisted-pair wires plug into. The trunk side and the core of the switch are all IP and include an interface that marries the TDM access lines to the VoIP core.

Carr believes the university can run the VoIP network more efficiently than the old phone network and automate more to cut operational costs, but the savings will go toward services not provided today. "I don't think the overall communications cost is going to decrease, because I'm going to take that platform and provide a whole bunch of other services," he says.

In addition to new services, the VoIP network will provide more resilience because the two physical switches will act as a single logical switch.

The university installed an IP phone switch on the Chicago campus, provisioned it and cut over all the phones to it about 10 months ago.

The Evanston switch will be upgraded so half of its core intelligence is in Chicago. Then service elements from the Chicago VoIP switch will be cut over to the Evanston switch, and that will become the switch for both campuses. This is being done in several incremental steps that reduce the likelihood of something going wrong and causing network downtime during the transition (see diagram).

Reliability starts in closets

Beyond switch survivability, Northwestern also was concerned about the reliability of its wiring closets with the added strain of Power over Ethernet switches and the demand for uptime that comes with VoIP.

The IP network serves more than 200 buildings and had more than 40 closets that were routing sites 10 years ago. These routing centers have been collapsed into 18 with plans to cut that number to 12.

Each remaining IP routing center will have redundant power and cooling systems. "Basically they look like mini data centers around the campus that can provide Level 3 redundancy for the router infrastructure and provide that never-go-away, always-available voice-over-IP environment," Carr says.

Each new routing center has a large DC plant, generator backup, cooling systems and multiple power feeds if they are available. The Cisco 6509 routers remain the same. "These are long-term investments that will last us through multiple revisions of electronics," Carr says.

There may even be some cost savings by reducing the number of routers in the network. "If I can reduce my number of routers by a handful, already I'm saving dollars every five years when I have to swap those boxes out anyway," he says.

With concerns about reliability of the network addressed, the university considered voice quality and bought Brix Networks gear to check out network capacity to see if it would handle VoIP with appropriate QoS.

The Brix Verifiers are part of a testing mesh that makes phone calls all day to try to find problems with the infrastructure. The school plans to do similar stress testing for other high-load, important traffic before it comes on the network, Carr says. "I expect to deploy some set of inline devices that are looking at all the traffic and making sure that requests to a video application or even a request to our student enterprise system are being served at the service-level that we've defined for them," he says.

To help ensure VoIP quality, at least initially, the university is setting up a separate virtual LAN, but as more users adopt softphones on their laptops and PCs, a VoIP VLAN will become harder to enforce. "People are going to be running their phones on their computers, so creating all these separate VLANs is not going to function all that well," Carr says.

As a result, the university plans to tag VoIP packets for high QoS outside the VLAN. "The construct of the separate VLAN will continue in very focused areas, making it easier to secure the phones, secure the communication pathways and ensure quality of service," Carr says. "But I think for the general user that opportunity is going to diminish and go away in three to five years."

Carr says he's not sure what mix of services the university will ultimately support with VoIP, but is certain that the role of telecom has changed.

"I'm no longer the phone company," he says, "but I'm the communication interconnect for the campus. That means if your preferred method for making a phone call is from your PDA to your partner's Xbox, the infrastructure should allow that to happen. It should allow you to communicate in any way that you want and help facilitate that communication." ■

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Wireless

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cost, almost a necessary cost for 11n."

"11n adds an incentive to go to gigE [in the wired infrastructure]," says Craig Mathias, principal with Farpoint Group.

One issue related to upgrading a cable plant, given the capacity of 11n, is whether to upgrade Ethernet wall jacks; that's a decision about whether the wireless infrastructure becomes the principal means of network access.

If existing WLAN controllers lack the network capacity and the processing power and memory needed to handle increased traffic, they'll have to be replaced, especially if the vendor has a purely centralized architecture, with every packet running from each access point to the controller. Vendors have been upgrading their controllers over the past year with 11n in mind, sometimes also offloading packet-switching functions to the access points, creating a distributed data plane.

802.11n market at a glance

Total equipment revenue: More than $150 million, since products introduced in second quarter, 2006

Top three suppliers: Linksys, Netgear, D-Link

SOURCE: DELL'ORO GROUP

"With this kind of distributed data plane, there's no bottleneck at the controller," Mathias says. "If you have Meru [Networks] or Extricom, you have centralized data and control planes. But if you design the box to handle whatever is thrown at it, it's not a problem."

Benchmarking wireless performance to verify such things as workloads and traffic conditions is likely to become much more important for 11n networks. To do this, enterprises or systems integrators will use complex performance-testing tools, such as those from VeriWave and Azimuth Systems, which previously had been used mainly by radio chip makers and equipment manufacturers. "This will be a big thing down the road," Mathias predicts.

The PoE issue may catch some users by surprise. "The PoE infrastructure may have its upper limits tested by 11n deployments [that are] used to their maximum capabilities," says Chris Silva, an analyst at Forrester Research.

PoE lets you run one cable between switch and access point instead of two — potentially a big savings. But 11n access points draw more electricity than the 15.4 watts maximum provided by power injectors based on the IEEE 802.3af standard. That maximum will at least double with a new standard, 802.3at, being finalized. At least one vendor, Trapeze Networks, has created new code that lets its just-announced 11n access point use existing PoE injectors, but there are tradeoffs in terms of performance.

"The promise of 11n is more than simply going faster," says Phil Belanger, managing director for Novarum. "The increased range of 11n will make it more practical to deploy large systems using the 5GHz band, which has many more channels than the 2.4GHz and has not been used very much to date. That, in turn, will enable much higher capacity WLANs. For many enterprises, a wireless network that delivers hundreds of megabits of capacity everywhere will be good enough to be the only network."

What's the biggest looming wireless or mobile security threat?

We've identified three, but we'll save one of them (denial of service) for Part 2 of this story in next week's issue.

The two other threats are emblematic of two very different human dynamics. The first springs from the increasing cunning of attackers, the second from the continuing ignorance of users and even IT professionals about the nature of wireless threats.

In 2006, researchers identified problems with wireless-interface device drivers that could be exploited in various ways by attackers. Drivers function at the level of the operating system kernel, where malicious code potentially has access to all parts of the system.

Typically these driver vulnerabilities involve manipulating the lengths of specific pieces of information contained in the wireless management frames, causing a buffer overflow where a malicious payload can be executed, says Andrew Lockhart, security analyst with Network Chemistry.

"A driver will process these data elements whether or not [the adapter is] associated with an access point. So the combination of simply having a powered-on wireless card with a vulnerable driver can leave a user open to attack," he says.

The obvious solution is to replace the vulnerable drivers, but that is an ad hoc process. "In the Windows world, most wireless drivers are part of a third-party software package, so they don't get updated with a Windows update, which makes it troublesome to eliminate the problem, and it will likely be a problem for a while," Lockhart says.

Wi-Fi security advice

Gartner says:

- Evaluate cellular data plans as alternative to public Wi-Fi hotspot access in hotels and coffee shops.
- Equip wireless laptops with a personal firewall that enforces security policies.
- Scan and update laptops with revised security settings, software patches, and updated antivirus and antispyware applications.
- Consider "connection agent" corporate packages, such as those offered by iBahn, T-Mobile, iPass, Fiberlink Communications and others: a small agent running on the laptop with advanced security protocols for two-way authentication.
- Protect access to corporate network by remote workers using personal PCs with on-demand security tools over SSL VPNs.
- Authenticate users with two strong factors. Ideally, one factor should be a one-time password.
- Use VoIP only over a VPN.

Attackers are becoming smarter about what and how they attack, increasingly using evasion tactics to sidestep or confuse wireless intrusion detection/prevention (IDS/IPS) applications. The long-term solution is smarter IDS/IPS systems that monitor and analyze wireless traffic and behaviors more comprehensively.

But researchers, such as those at Dartmouth College's Project MAP (measure, analyze and protect), are in the early stages of such work.

The second wireless threat is related to the fact that many mobile users seem not to be getting smarter about wireless security. "The biggest threat is people who use open Wi-Fi access points and don't use encryption or VPNs," says David Kotz, Dartmouth professor of computer science and one of the lead Project MAP researchers. "They trust some random hotspot operator or open access point somewhere with their personal or professional data. People are careless."

That's putting it diplomatically.

Security consultant Winn Schwartau likes to tell how his then-12-year-old son used a Windows-based Palm Treo to eavesdrop wirelessly on business executives using laptops or PDAs on an airport or other public Wi-Fi network.

He routinely collected user-name-password combinations for corporate networks. "My son had passwords to 40 of the Fortune 100 [networks]," he says.

The key vulnerability was that these users — even if they used an encrypted VPN tunnel to access the corporate network — repeatedly used an unencrypted wireless link to access Internet mail or other Web sites in the clear. That enabled the younger Schwartau to collect information to access the user's Web mail account. He then sent the user an e-mail from his own account: "I can then infect that machine [with malicious code], and have access to your VPN account," Schwartau wrote.

The inverse of this problem is letting personal mobile devices that have been exposed to the Internet in the wild connect to corporate networks.

"Normal security standards and procedures are often ignored when users are allowed to connect their own devices," says Lora Mellies, information security officer at Hartsfield-Jackson Atlanta International Airport.

"For instance, there may be no scheme to regularly back up the information, no firewall or antivirus protection installed, and no use of encryption for confidentiality, or [of] tokens or certificates for strong authentication," she says.

"No one can define the perimeter [of the corporate network] anymore," Schwartau says. "The rule is: 'Thou shalt connect nowhere except to the corporate network; once you're there, you can do whatever you want, but we'll be watching you.'"

This threat will only get worse as the number of ill-trained mobile users grows, along with the ballooning amount of sensitive or proprietary corporate data on their mobile devices.

Is wireless [Wi-Fi-based] VoIP worth the bother?

Judging from the market, where enterprises vote with their dollars, the answer is generally "no," at least for large-scale deployments.

There are exceptions, though rare, and they tend to prove the rule. One of the most often cited is Osaka Gas in Japan. The utility used Meru's WLAN infrastructure to support 6,000 mobile phones that were equipped with cellular and Wi-Fi network interfaces. The price tag for the whole project: $10 million.

The reluctance to embrace large-scale wireless VoIP isn't surprising. Enterprisewide wireline-VoIP deployments have found traction only fairly recently, and many of these have been angst-

See Wireless, page 12

VoIP over Wi-Fi market projections (North America)

	2007	2012
VoIP access points for enterprises	$442 million	$1.75 billion
VoIP wireless LAN switch and mobility controllers	$500 million	$2.7 billion
VoIP over Wi-Fi handsets (Wi-Fi only)	$93 million	$600 million

SOURCE:JUNIPER RESEARCH

Wireless

continued from page 10

ridden. To be fair, often the angst is created by specific issues or problems at a given enterprise site.

Using a wireless connection in place of a wired one adds lots of complexities, however, solutions to which are only slowly maturing. Access points have to be distributed pervasively to support voice traffic, while radio interference easily affects voice quality or call sessions. Wireless eavesdropping on unsecured VoIP sessions is another worry for enterprise managers.

It's also difficult to pinpoint savings, Forrester's Silva says. "Wireless VoIP has been positioned as a way to replace cellular minutes of use," he says. "But corporate IT doesn't have a good handle on what they're actually spending on this: It's often just expensed. So it's hard to make a case for savings and hard therefore to make a case for investing in VoIP over WLAN."

Over the course of three months we tested WLAN switches and access points from Aruba Networks, Chantry Networks (now Siemens), Cisco and Colubris Networks for audio-quality QoS enforcement, roaming capabilities and system features. Among our findings:

- With QoS enforcement turned on and with only voice traffic on the network, calls nearly matched toll-quality audio.
- With even a small amount of data traffic, dropped calls became common and audio quality was poor, even with QoS enabled.
- Roaming from one access point to another either failed or took so long (0.5 seconds to 10 seconds) that calls dropped.

Those findings reflect some of the experiences at Dartmouth, which embraced a limited VoIP deployment on its pervasive, Aruba-based, campus WLAN four years ago. Initially some college staff used the wearable, mobile VoIP phone from Vocera Communications. There were some problems with roaming, according to David Bucciero, Dartmouth director of technical services, who despite these teething pains, is one who says wireless VoIP is worth the hassle.

More recently, the college has added just under 100 Cisco 7920 wireless-VoIP handsets which "were flawless," though latency was an issue early in the deployment, Bucciero says. Reducing those delays has been an ongoing tuning process, Dartmouth working closely with Aruba and Cisco, the college's wireline-network vendor.

Things have changed in two years, including the advent of the 802.11e QoS standard, augmented by continued proprietary QoS tweaks, and faster handoffs between access points.

The real change, however, has been the growing interest in, and number of products for, shifting call sessions automatically between cellular and Wi-Fi nets. At the enterprise level, this convergence entails an IP PBX, usually a Session Initiation Protocol (SIP) server; the WLAN infrastructure; new, specialized servers from start-ups such as DiVitas Networks and established players such as Siemens; and accompanying client code running on dual-mode handsets, which have a cellular and a Wi-Fi radio.

Dartmouth is doing exactly this, running a pilot test with the Nokia E61i, a dual-mode mobile phone recently introduced in the United States as part of its convergence partnership with Cisco. The handsets use SIP to talk to the Cisco CallManager IP PBX.

"Cellular and Wi-Fi convergence is the real pull for VoIP over WLANs," Farpoint's Mathias says. "Once that [convergence] happens, then we can converge dialing directories, voice mail, other services, and have one phone that works everywhere." ■

Next week we answer these questions:

- **Will my organization need to change to support enterprise mobility?**
- **How do I control costs in an expanding mobile and wireless environment?**
- **What can I do about wireless denial-of-service attacks and interference?**

Qualcomm to seek Bush veto

BY JOHN COX

Almost as soon as the unfavorable ruling by the U.S. International Trade Commission had been posted, Qualcomm declared it would seek a stay in the federal courts and a veto from the White House.

The ITC ruling last Thursday banned the importation of certain Qualcomm 3G chips, chipsets and circuit boards, as well as some wireless handsets that use them. The commission had ruled previously that Qualcomm was infringing a U.S. patent held by rival chip maker Broadcom. Three of the commissioners voted in favor of the order, and the remaining two voted "for a more limited form of relief," according to the ITC statement.

The ITC action is the latest legal setback for Qualcomm, which has a reputation for jealously protecting its intellectual property and driving tough licensing deals for its chip technology, the basis for many of the Code Division Multiple Access and Wireless CDMA cellular networks worldwide.

Qualcomm issued a statement saying it was "extremely disappointed" with the ITC ruling, which "does not protect the public interest or public safety." All the commissioners acknowledged that the decision to ban importation of the Evolution Data Optimized and WCDMA handsets "could adversely affect the public interest, particularly the public health and welfare." The majority concluded that exempting products already imported "sufficiently ameliorates that impact."

Qualcomm is asking the Federal Circuit Court of Appeals to delay enforcing the ITC decision while it seeks a White House veto. The president's decision must come within 60 days of the ruling. ■

10 free virtualization tools worth a look

Microsoft, VMware joins open source community to offer technology test drive

BY DENI CONNOR

More IT shops are validating the benefits of desktop and server virtualization, from energy efficiency to better resource utilization. But if you're still leery of forking over big dollars for the technology, there are some low-cost and no-cost ways to give virtualization a try.

Virtualization freebies are available from the open source community and from vendors such as Microsoft and VMware. Here's a sampling:

Microsoft Virtual Server 2005 R2

A virtualization environment for Windows Server 2003, Server 2003 Service Pack 1, XP Professional Edition and XP Service Pack 2. It works on x86 servers or workstations and is available in 32- or 64-bit versions.

OpenVZ

Linux-based software that lets the IT administrator create secure virtual environments. Each virtual private server can be rebooted independently, co-existing with other virtual private servers.

The open source project is supported by SWsoft, which markets a commercial version called Virtuozzo.

Q

Open source software for running Windows or Linux on a Macintosh. It lets users switch between guest PCs and restart guest PCs at any point. Q also enables users to exchange files between the host operating system and the guest.

Q is based on the QEMU open source CPU emulator. You need to be careful about using Q — according to the Web site, it is still alpha software.

QEMU

A generic and open source machine emulator and virtualization software developed by Fabrice Bellard, the author of a compact C compiler. QEMU can run operating systems and programs developed for one machine on a different machine.

When used as virtualization software, the host and guest machine must use x86-compatible processors. In emulation mode, it supports x86 PFCs, MIPS R4000, Sun SPARC and PowerPC processors.

Technical Architecture Solutions TCO Calculator

Technical Architecture Solutions, a disaster recovery and business continuity consultancy, is offering a TCO Calculator for server virtualization. It is Web-based and allows IT administrators to estimate how much money they will save by using VMware ESX. The calculator consists of a Microsoft Excel spreadsheet and is based on four virtual machines per virtual server.

VMware Server, Player and Converter

VMware Server is VMware's starter kit for Windows and Linux server virtualization. It can host Windows, Linux, NetWare and Solaris as guest operating systems.

VMware Player lets IT administrators run virtual machine instances created by other VMware products. With it, you can download prebuilt virtual machines from the VMware Technology Network or share them with other organizations.

Virtual Iron Single Server Virtualization and Management

Virtual Iron's Single Server Virtualization and Management software creates Linux or Windows virtual servers. It runs in 32- and 64-bit workloads that are stored on iSCSI, storage-area networks or local storage. Virtualized nodes created with Virtual Iron's Single Server software must have Intel Virtualization Technology or AMD Virtualization hardware assist.

Virtual Iron and Provision Networks Virtual Desktop Infrastructure

An alternative to terminal services environments and fat-client desktop implementations. It lets an IT administrator host five individual Windows desktop PCs inside virtual machines running on servers in the data center.

Xen

This open source package for x86 server virtualization was developed by the University of Cambridge and commercialized by XenSource. Xen, which runs on Linux, supports Windows and Linux as guest operating systems.

XenSource XenExpress

XenExpress, from XenSource, is a free virtualization package for x86 servers that lets IT administrators host as many as four virtual machines on servers equipped with 4GB of physical RAM or two physical sockets.

It supports Windows Server 2003, XP and 2000 as guest operating systems. It also supports Red Hat, SUSE and Debian Linux guest operating systems.

XenExpress is based on the open source Xen hypervisor. ■

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Virtualization event

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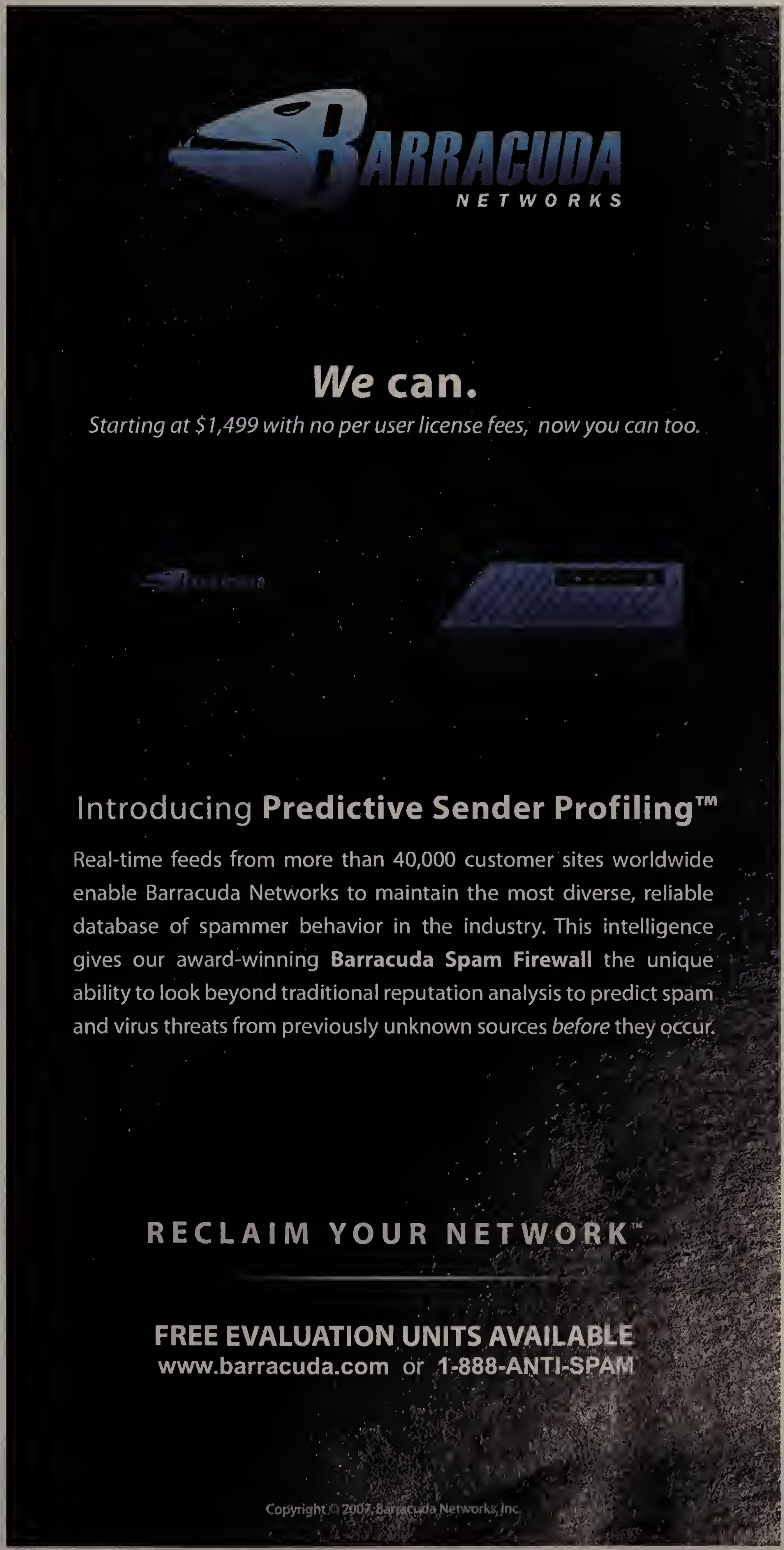

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Vista

continued from page 1

predecessor, IPv4. IPv6 also has autoconfiguration and end-to-end security.

Vista supports IPv6 by default. It runs a single-stack, dual-IP-layer architecture, which means it is IPv4- and IPv6-capable out of the box. It supports tunneling of IPv6 traffic over an IPv4 backbone and includes IPSec that works for both IPv4 and IPv6.

Management software vendors and users are reporting problems with Vista's IPv6 support.

"Vista is showing some serious deficiencies around IPv6 and IPv4 insofar as their compliance or the transparency of their compliance around IP behaviors," says Loki Jorgenson, chief scientist for Apparent Networks, a network assessment tools vendor.

"For example, Vista doesn't expose any of the ICMP errors to applications running on Vista," Jorgenson says. "The application can't get access to that message, and subsequently all it sees is that the network connection is not working. This is a big challenge for us around Vista. It's not clear at all why IPv6 isn't properly supported in this regard."

Duane Murphy, president of Managed Information Services in Long Beach, Calif., says he has experienced problems with Vista's IPv6 implementation on the networks he runs for law firms. Murphy used Network Instruments' Observer 12 application, which supports IPv6, to isolate Vista's IPv6 problems.

"We are seeing a number of applications that are IP-based that do not like the addressing scheme of IPv6," he says. "We will send a print job to an IP-based printer, and the print job becomes corrupted. We're seeing this with Windows Vista machines. When IPv6 is installed, this happens without fail. As soon as we remove IPv6, all of our printer functions return to normal."

Murphy says the problem has cropped up on 45 Dell Latitudes and Dimensions running Vista Business or Ultimate.

"We're also seeing loss of network connections on IP when you have both IPv6 and IPv4 loaded on the same machine with an IPv4-based network," Murphy says. "As soon as we remove IPv6, we suddenly have connectivity to the rest of the local workstations."

Murphy says he believes the problems stem from Vista's IPv6 implementation.

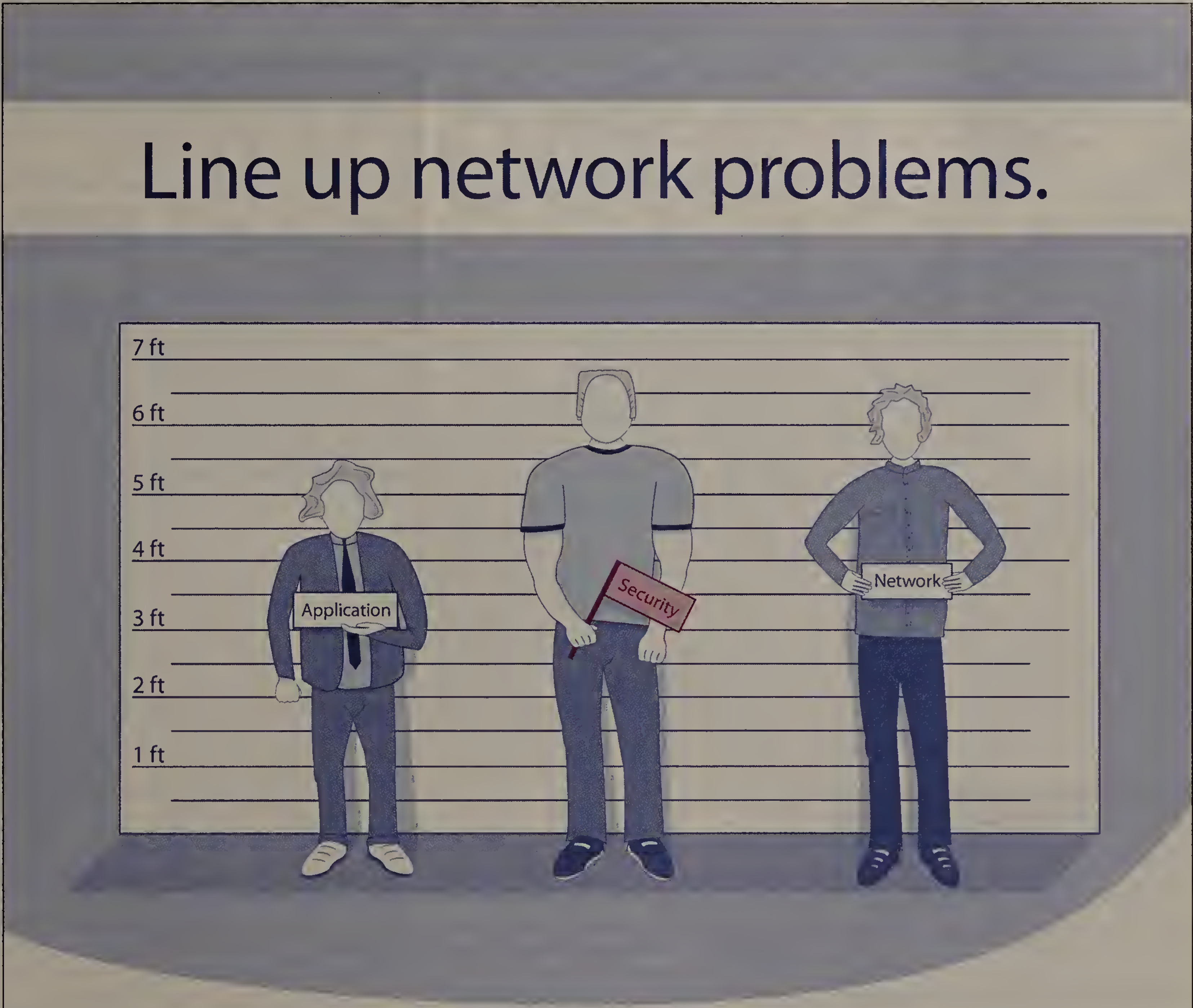
"We are connecting Observer to the monitoring port of a Cisco or HP switch, which allows us to monitor all the traffic across the network," he says. "We figure out the name of each workstation, then we do a protocol analysis to figure out what protocols are running across the network. Once we do the protocol analysis, we can drill down on IPv6 and figure out what's wrong."

Murphy says he is recommending that his clients remove IPv6 from their Vista workstations.

Microsoft says it is difficult to comment on the problems Murphy has faced with Vista's IPv6 implementation but the company has taken steps to address these types of compatibility issues.

"We recognize that not all applications and drivers were up to date by launch and that there have been some compatibility issues as a result," says Ian Hameroff, senior product manager with Windows Server Networking. "But we also know that Windows Vista is the highest-quality, most secure and most broadly supported operating system we've ever released."

Hameroff adds that Microsoft is running an IPv6 network and "to my knowledge has not experienced these types of issues" that Murphy describes.■



TECHNOLOGY UPDATE

AN INSIDE LOOK AT TECHNOLOGIES AND STANDARDS

Net TAPS without the overhead

BY ALASTAIR HARTRUP

Network test access ports were developed as portable diagnostic tools to gain temporary, out-of-band, nonintrusive access to traffic between two network devices.

Today, TAPs are available for permanent deployment in the data center, helping enterprises manage complex infrastructures. Leveraging a permanent out-of-band network access platform (permanent TAP), users are able to maintain 24/7 network visibility and real-time management benefits without affecting network performance.

Where SPAN (mirrored switch ports) and other network deployment methods once held their own, the increasing data load placed on these tools is severely affecting enterprise infrastructure management.

Permanent TAP solutions avoid bandwidth pitfalls by establishing an out-of-band platform to deploy any critical network device. With a physical TAP integrated in a desired segment, the out-of-band device has uninterrupted, hardware-level visibility into the tapped network traffic without having to compete for access and, most importantly, without affecting network flow.

The detailed visibility that permanent TAPs provide is ideal for enterprise monitoring and management, giving TAP-attached devices the ability to identify errors and events — including link-layer events — within the network.

Conventional deployment methods are complicated by the fact that network tools, such as intrusion-prevention systems, require in-band deployment to actively sort through real-time traffic. If not properly integrated, inline devices can create points of failure.

To address these concerns, permanent TAPs can be used to move live traffic through out-of-band deployed devices without introducing points of failure; this is commonly referred to as virtual inline installation. When implemented, a virtual inline TAP safely feeds live traffic through the out-of-band device and back onto the network segment, providing the benefits of in-band deployment without the risk of point failure.

While vendors use various methods to accomplish this, the key to achieving virtual inline installation is through a bypassable fail-safe connection capable of keeping the original network path available in the event of power loss or network device failure.

A permanent TAP solution can achieve this, for example, by constantly checking the health/availability of the deployed device by passing "heartbeat"-monitoring packets through its out-of-band network path. Inserted into one end of the path, if the heartbeat isn't detected on the other end, the out-of-band network connection is immediately bypassed and traffic will flow along its original path as if the TAP were never there. This fail-safe capability helps ensure that the network device is always functioning properly and removes the threat of inline point failure.

Using virtual inline installation, devices can also be manually bypassed for real-time change control. This is especially valuable when security patches are needed for a device that cannot wait for the next scheduled maintenance period. Using the TAP-bypass method, the out-of-band device is brought offline for change and then brought back online once it's ready to use again.

The features and options developed for permanent TAPs continue to mirror the needs of evolving enterprise-class systems. Permanent TAPs are designed to fit into 1U and 2U data center rack spaces, and come readily available with AC or DC power supplies.

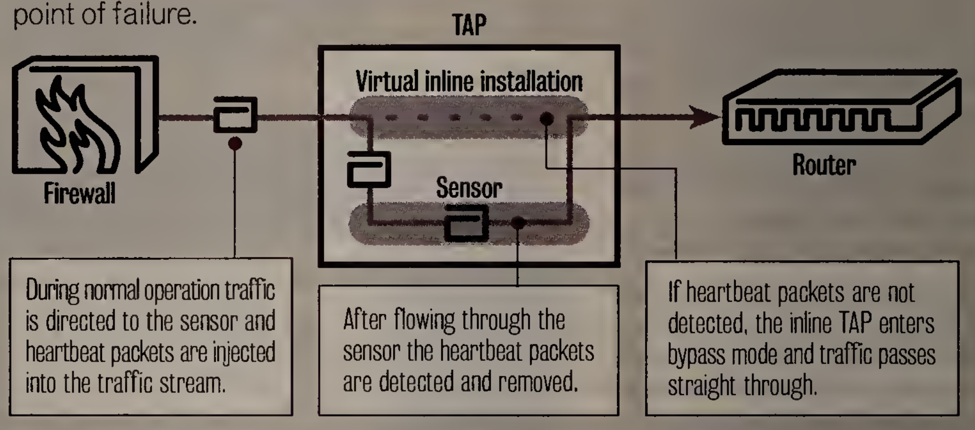
With features like many-to-many TAP-connection systems, traffic stream aggregation, two-way traffic visibility, multiple port monitoring, fiber-to-copper and copper-to-fiber connections, TAPs are clearly positioned to provide users with improved ways to integrate network devices, and monitor and manage critical infrastructure.

As enterprise systems continue to expand, the ability to carry out network management from a 24/7 out-of-band access platform may provide the missing link needed to resolve today's growing enterprise challenges.

Hartrup is founder and CEO of Network Critical. He can be reached at alastair.hartrup@networkcritical.com. – www.criticalTAP.com

Test access points take out the risk

Inline devices can be attached to the network without fear of introducing a point of failure.



During normal operation traffic is directed to the sensor and heartbeat packets are injected into the traffic stream.

After flowing through the sensor the heartbeat packets are detected and removed.

If heartbeat packets are not detected, the inline TAP enters bypass mode and traffic passes straight through.

Got great ideas?

Network World is looking for great ideas for future Tech Updates. If you've got one, and want to contribute it to a future issue, contact Editor in Chief **John Dix (jdix@nww.com).**

Ask Dr. Internet

By Steve Blass

I have two questions about using Dreamweaver and Flash to publish video on Web pages. The first is how can I connect Dreamweaver to a site using a nonstandard SFTP port? The second is how do I convert a Windows movie file to a Flash video and put it in a Web page?

To connect to an SFTP server on a nonstandard port in Dreamweaver you place the port number in the FTP Host text box after the host name so that instead of just having "MyFTPHost" in the host field you have "MyFTPHost portnum" with a space between the host name and the port number.

To create Flash video for publication, start by opening Flash and creating a new Flash document. Now choose the File menu, select the Import->Import Video option and navigate to your source video file using the Browse button in the Import Video dialog. Click Next and choose your deployment method in the next dialog. Progressive download is probably your best choice. Click Next and choose the encoding method for the video; accepting the defaults is a safe choice. Click Next and choose the "skin" for your video presentation from the list in the dialog. Now click Next and your video will be encoded. You then can use the Modify/Document menu item to resize your Flash stage to match your video. Now select Publish from the File menu to publish your swf, flv, fla and html files to a local directory. Now you are ready to publish the files to your Web site using Dreamweaver.

Blass is an IT manager in Phoenix. He can be reached at drinternet@jshnee.com.

Virtual burn and rip

GEARHEAD
INSIDE THE NETWORK MACHINE

Mark Gibbs

OK, I'm back to my theme of CD and DVD creation and management tools that I delayed for a week while I discussed some cool new hardware.

But first, a couple of corrections: Last week I wrote that the Saitek Obsidian Wireless mouse cradle charges the mouse. Not true — the mouse is powered only by the rechargeable batteries that come with it. I also failed to mention that the mouse has a total of five buttons — the two regular left and right buttons I mentioned, as well as one on the right that can be used by some applications and two on the left that work with Internet Explorer to go forward and backward.

Now that I'm in my second week of using the Saitek Obsidian I am a little more reserved in my enthusiasm. It is still one sleek mouse, but its touch-sensitive scroll feature is too sensitive. This means that often when you don't want scroll-lock to lock, it does. Another issue is that I often press the two left-side buttons accidentally and a lot of swearing is the result. But these issues may disappear when I get more accustomed to it.

Anyway, back to CD and DVD stuff: I'd wondered for some time whether there was a product that could create a virtual CD burner so I could burn virtual CDs from iTunes.

My thinking on this is that, like almost everyone I know, after I buy music from iTunes I often want to listen to it on a device other than an iPod. To do this I have to burn the tracks to a CD, then rip that CD to MP3 files. While the process does give me a backup copy, it wastes CDs and is always far more time-consuming than I would like.

So, after looking around and trying a few products that didn't do what I wanted — they provided only a virtual drive and weren't actual burner emulators — I stumbled across an ambitious piece of software engineering named Virtual CD published by H+H Software.

> After I buy music from iTunes I often want to listen to it on a device other than an iPod.

Virtual CD is available as both 32- and 64-bit drivers for Windows XP, Windows XP64 and Windows Vista, and is pretty painless to install. Given that it is a device driver, I didn't mind having to reboot (something I consider a sin when installing any nonsystem-level program).

Virtual CD's main user interface, the Toolbox, gives you access to the suite's huge number of functions. There's also an optional "autohideable" task pane that provides access to all of the functions, and you can create simple scripts that can load, burn and unload virtual and real media.

The top-level features include "Main tasks in Virtual CD," "Working with virtual CDs," "Burning virtual CDs and DVDs," "Helper programs," "All Virtual CD programs" and "Documentation." Any feature can be saved as a shortcut to the desktop, which makes workflow automation very easy.

You can define as many as 23 drives as burners or read-only drives and, as far as the software I've tried is concerned, the Virtual CD drives look exactly like what they are supposed to be — real drives.

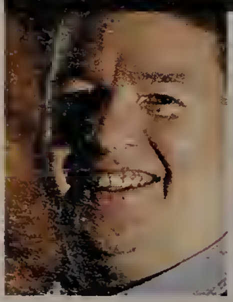
I configured a virtual burner on drive K: and under the "Burning virtual CDs and DVDs," ran the feature to create a virtual blank, 700MB, ISO-formatted CD, which I then loaded onto K:drive.

After setting up the burner I instructed iTunes to burn an audio CD with a sample rate of 192Kbps. Because the drive is a virtual burner, burning happens at a much higher speed than it would with a real burner. According to the company, the virtual burners can run as fast as 78X for CDs and 9.8X for DVDs; the actual speed, of course, depends on your specific PC configuration. I haven't yet tried burning virtual DVDs, but for virtual CDs I got about 60X.

Now that I had a virtual CD, I ripped it to MP3s using WinAmp, which in turn used CD Database to identify the content and fill in the MP3 header fields. Perfect.

The only drawback with Virtual CD is that it does so much it's hard to find your way around, and it could be a bit better organized. Virtual CD does have an API so you can integrate its functions with other applications. In addition, there are network versions so you can manage virtual burners and drives on multiple workstations. All told, Virtual CD is an amazing product — and at $39.95, a steal!

Whatchathink? Tell gearhead@gibbs.com.



CoolTools

Quick takes on high-tech toys. **Keith Shaw**

Samsung's UpStage offers two sides with different features — one is a phone and the other is a music player.

The scoop: UpStage (model SPH-M620) with Sprint Nextel service, by Samsung, about $300 ($100 with rebates and two-year activation).

What it is: With last week's announcement by Apple that the heavily hyped iPhone will be available on June 29, time is running out for phone companies to come up with their own iPhone killer or iPhone alternative. Looking at the dual-sided Upstage mobile phone, one has to wonder why nobody thought of merging a mobile phone and a digital music player before. Until now, most vendors of mobile phones with multiple applications and features squeezed them into the phone interface and hoped users would be able to figure out how to use the cell-phone keypad for listening to music or taking a digital photo.

Along the way someone thought, "let's just have a second screen and put it on the back of the phone." Brilliant. So, on one side of the UpStage is a larger screen that's dedicated to playing music. Its thin silhouette reminds me of the iPod nano. If you want to make or answer a phone call, you push the "flip" button on the side and turn the phone around, and voilà, you have a standard cell-phone user interface and keypad.

Why it's cool: That the UpStage is dual-sided is its coolest feature, but the device also lets you download songs over the air from the Sprint Music Store — or you can "side load" music onto the miniSD card through a PC (it comes with an SD card adapter as well as a USB cable). Other features are a 1.3-megapixel digital camera and camcorder, Bluetooth connectivity for a hands-free headset, and Bluetooth headphones (for listening to music wirelessly).

Some caveats: The music-player side of the UpStage wants to be more like an iPhone, with a touch-sensitive keypad instead of buttons to push. Training yourself to apply the correct pressure on the keypad to make the right choice takes a while, and you'll either get very frustrated by this process or you'll bear with it and just curse at the menu on occasions. I think Samsung was trying to be too cute, providing the touch interface instead of a better system of navigating around menus.

Holding the UpStage can be tricky also. No matter which side you're looking at, the other side will be touching your hand, and both displays eventually will have to be cleaned of handprints, fingerprints and so forth. Fortunately, the UpStage comes with a cover battery pack that doubles as a second portable battery and case cover to protect it from scratches while you're carrying it around.

Bottom line: With the Apple iPhone (available exclusively from AT&T) coming very soon, it should be interesting to see whether Sprint will market the UpStage as an iPhone killer or as an iPhone alternative. From a technical standpoint the UpStage has many (if not more) of the features the iPhone claims to support. Without the Apple mystique, however, it could face an uphill battle as other vendors and carriers come out with their own iPhone combatants.

Grade: ★★★★ (out of five)

Shaw can be reached at kshaw@nww.com. New Cool Tools video every Thursday, and Twisted Pair Podcast every Friday at www.networkworld.com.

"as a security measure, pogo sticks worked for awhile, then we opted for the stilts which worked brilliantly... until today."

On Technology

John Dix

Bots on your net? Look twice

Think the botnets you read about consist solely of zombies on unprotected consumer PCs? Think again.

Gartner predicts that by year-end 75% of enterprises "will be infected with undetected, financially motivated, targeted malware that evaded traditional perimeter and host defenses," and early reports from beta customers of a yet to be released product from Mi5 show how nefarious these infections can be.

Mi5 says it installed a Web security beta product at an organization with 12,000 nodes and in one month detected 22 active bots, 123 inactive bots and was watching another 313 suspected bots. That may not sound like a lot, but those bots were responsible for 136 million bot-related incidents, such as scanning for other hosts inside the firewall.

Web sites are the source of all this nasty code, Mi5 says, and Google research backs that up. In a recently released report (see www.nwdocfinder.com/9027) Google researchers say they did an in-depth analysis of 4.5 million URLs and found that 450,000 — one in 10 — were "successfully launching drive-by-downloads of malware binaries." Another 700,000 URLs seemed malicious but the researchers had lower confidence in their ability to label them as such.

Once bots have successfully infected corporate resources, they scan the network for vulnerable hosts, spread where they can and report back to central command about how many systems are under control. The network is then available for whatever wrongdoing the botnet operator has in mind, be that generating spam, launching denial-of-service attacks or collecting confidential data.

Bot communications with controllers is where bots are most detectable/vulnerable, Mi5 says, so reporting is typically limited to a few messages per month. That's one of the things that makes bots difficult to detect, but a host of other developments contribute as well.

For one, botnets today typically have multiple control servers. "It used to be if you cut off the head you killed the net," says Doug Camplejohn, Mi5 CEO. Now botnets have multiple heads, and control can be changed every few minutes. They even dynamically change IP addresses.

And two, bots also are infecting more than just desktops. SMTP servers are a common target, Camplejohn says, and servers in general are being increasingly targeted, even Unix-based servers.

How much do the bad guys make using your resources to run their business? Camplejohn says the going rate is about 5 cents per node, so $50,000 rents a million-node network capable of generating 20 to 25 gigabits worth of traffic.

Do you know what's on your network?

— John Dix
Editor in chief
jdix@nww.com

Opinions

Calling Microsoft's bluff

In reference to Tom Henderson's story "A call to action against Microsoft's open source threats" (www.nwdocfinder.com/9024), I have to take issue with him regarding the quality of Microsoft's products. They have always been buggy and counterintuitive to use.

With regard to the concept of patents, they were invented by King James to benefit society, not individuals. If there were no software patents, would it result in less-innovative software being written? I think not. Are monopolies, in any guise, good for democratic capitalist society? I think not. Do software patents teach us anything we wouldn't already know or be able to figure out ourselves? I think not. In other words, there is no merit in the concept of software patents.

Consider another aspect of this matter. It is an offense to obtain money by menacing someone. Without substantive proof, Microsoft is demanding money from people using open source. I think it would be a better proposition to mount a class-action suit against Microsoft seeking fines of millions of dollars a day until it withdraws its claims and proves, through a normal process of law, its claims have substance.

Microsoft should be required to prove its case before it causes alarm by demanding payment where none is due. To the reasonable person, it seems Microsoft's tactics aim to discourage investment and stymie the use of open source software by corporations. On the basis of what is known, it would appear Microsoft could be guilty of fraudulent behavior in that it seeks to benefit through deception.

To do this constitutes an offense under common law. If it proves its case, it should make public the source code it claims has been infringed. Once Microsoft has provided the source code, it should be placed on a Web site for worldwide scrutiny to determine if there is prior art [a patent term referring to existing knowledge] or if the code has been copied from someone else. I am certain that anyone skilled in the art would find the code to be of an obvious nature.

Kevin Loughrey
Managing director
A Perfect PC and Non Volatile Technologies
Sydney, Australia

Support for Musthaler

Re: Linda Musthaler's column on broadband being vital to the United States' economic future (www.nwdocfinder.com/9025), thank you for an excellent exposé of what we lack. It took stamina and guts to open the door for the American people to know how much they are being screwed. I would be willing to do anything I can to help, but as a woman, past 60 and handicapped, who is going to listen to me?

Leeland Webster
North Wilkesboro, N.C.

Kudos for CCleaner

In reference to Mark Gibbs' recent column "Getting rid of the rest of the cruft" (www.nwdocfinder.com/9026), the best features of CCleaner are that it has a small footprint and can be run by right-clicking the Recycle Bin. But the best feature of all is the Secure Delete function, which lets you shred data with a 7 pass NSA deletion method.

Matthew G. Davidson
Glastonbury, Conn.

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

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>> SESSION 2

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SERVERS, CONTINUED FROM PAGE 1

> Because vendor blade offerings have at least some things in common, we believe these test results are applicable generally to blades from other vendors — Dell and HP, for example — although there may be vendor-specific considerations in assessing products from other vendors.

We found that blade servers reduce but don't eliminate redundant hardware components requiring electrical power, a pivotal consideration in total cost of ownership (TCO). That said, while IBM's blade servers equaled the performance of its rackables, the blades were more power efficient and potentially much easier to service.

While rackables are less expensive than blades when buying only one or two servers because you have to factor in the cost of the blade chassis, a fully configured blade chassis is the more economical hardware buy than purchasing the same number of rackable servers. On the other hand, adopting a blade configuration demands a vendor lock-in that rackables don't because they can be added one at a time as needed. Also, blades fall short for applications that require large amounts of on-board storage.

Product details

We tested two types of blades from IBM, the HS21 and HS21 XM. Both slid into the IBM Blade Center H (BC-H) chassis comprising a 10GB Ethernet switch, a 1GB Ethernet switch and four power supplies. The XM had a 2.33GHz Intel quad-core CPU, and the HS21 had a 2.0GHz CPU. IBM sent the XMs with 16GB of double-data-rate, second-generation (DDR2) memory, and the HS21s with 8GB of DDR2 memory.

In their specifications, these blades are comparable to the two x3550 rack servers that IBM sent, except that there's more space available inside the x3550s. IBM also sent one x3650 2U server, which included three RAID drives in RAID 5 configuration, a RAID controller and a hot-spare drive.

Prices for the blades ranged from $7,100 for an HS21 with 2.0GHz twin-quad-core Intel CPUs with 8GB of memory, to $9,800 for a hefty HS21 XM with a twin set of Intel 2.33GHz quad-core CPUs, 16GB of memory and an onboard RAID 0/1 configuration. Additionally, the BC-H chassis runs about $17,000.

The rackables cost $7,900 to $9,300 depending on CPU clock-speed enhancements, extra memory and RAID controllers with extra drives.

Blade servers' drawbacks still prevent their adoption for some applications, such as those requiring large amounts of on-board, indeterminate storage expansion.

Even though performance tests among servers with comparable CPU clock and memory configurations were virtually identical, faster CPUs probably will arrive first in rackable form. This may not always be true, but our experience suggests any vendor can adapt the 1U or 2U form factor rapidly, while blade vendors have to plan in advance to accommodate new motherboard component combinations.

Blades' density sometimes works against them. They weigh more than rack-mounted servers. The backplanes of blade servers also represent potential (but rare) single points of failure — despite redundant power supplies and other duplicated or redundant components.

In addition, a data center using blades is captive to the vendor's business partners to supply such devices as storage-area network (SAN) switches or Ethernet switches, because these must be housed inside the blade chassis. This is OK if the vendor is competent, spares are available, and the chosen technology components mesh with current and proposed network operations center (NOC) gear. If all works with little orchestration, costs will remain low.

Performance is a wash

Performance among the IBM servers we tested was startlingly similar. All had Intel quad-core CPUs — two per server — and the performance variables we saw favored RAID 1 and RAID 5 configurations in terms of speed.

Our usual benchmark, LMBench3, showed that one of the tougher tests — processor fork+execve (which deals with file I/O and memory shifting) — executed in an average of 173.2 microsec vs. 289.9 microsec, a 40% increase in speed.

The results of all tests on all IBM servers were almost identical — except that the RAID drives on the HS21 XM models and x3650 server were slightly faster than NT-File-System- or ext3-formatted drives. The faster, 2.66GHz CPU clock of the x3550 and x3650 units gave them a slight performance edge as well.

Comparing the performance characteristics of these servers, therefore, is an exercise in apples-to-apples, if you'll pardon the testing pun.

It largely all boils down to power

Often, not enough attention is paid to what may be the largest server operational cost: power consumption.

IBM's stated power budget for the blades and the rack servers was higher than we measured. In our test, the low ambient temperature (our lab operates at 68 degrees Fahrenheit) and the fact that IBM could not supply us a fully loaded blade chassis may have contributed to lower-than-expected power consumption. We multiplied our measurements to obtain a comparison between 14 blade servers in the IBM chassis and 14 IBM rack servers.

If data-center cooling and power and the center's floor load-bearing qualities (the floor has to bear loads that literally can weigh a ton) are satisfactory, a blade chassis filled with blades provides the least expensive TCO in terms of power consumption over five years (see graphic, below).

Rack servers, compared with the components in the blade server and a fully loaded blade server, consume more power, and this adds to their infrastructure expenditures over a five-year life. The flexibility of hav-

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THE TALLY

Blades vs. rackables: What's got the edge?

This tally is based on our hands-on assessment of equivalent numbers of IBM XM blade servers and IBM x3550 and x3650 rackable servers.

	IBM blade server	IBM rackable server
Performance	✓	✓
Power consumption	✓	
Manageability	✓	✓
Serviceability	✓	
Initial cost of one server		✓
TCO over five years	✓	
Performance scalability	✓	
Internal upgrades		✓

TRACKING POWER CONSUMPTION

IBM server model	Base power consumption	Kilowatt hours consumed over five years	Total cost at 3 cents per kW/hour over five years
BC-H Chassis, no blades	.510 kilowatt/hr	22,350	$670.50
BC-H HS21 blade	.318 kilowatt/hr	13,936	$418.08
x3550 server	.373 kilowatt/hr	16,346	$490.39
x3650 server	.455 kilowatt/hr	19,940	$598.20
BC-H chassis with 14, HS21 blades	4.962 kilowatt/hr	217,455	$6,523.65
14 x3550 servers	5.222 kilowatt/hr	228,849	$6,865.46
14 x3650 servers	6.370 kilowatt/hr	279,259	$8,374.80

Figures do not include costs for cooling or redundancy. The server configurations tested were what IBM referred to as typical and did not have advanced options, maximum memory and any additional Fibre Channel, InfiniBand or other PCIe bus cards that probably would lead to higher power consumption.


VoIP AS YOU ARE.

Servers

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ing RAID 5 in a rack server is offset by its power consumption, although with a blade configuration you might run into additional costs for external storage.

Toward TCO

The cost of the IBM blade server configured with the maximum 14 blades is $117,400. Add power consumption (except for the cost of cooling), and the total becomes $123,900.

The equivalent number of x3550 1U servers at $7,900 comes to $116,700. When the cost of the needed six-port 10G Ethernet and 24-port Gigabit Ethernet switches and power consumption costs are added, the cost climbs to $129,200. The x3650 has a total capital cost of $129,800 ($9,300 each), and with the aforementioned 10G Ethernet and Gigabit Ethernet switches plus power consumption, the cost comes to a whopping $150,700.

In the widest stretch, between the loaded BC-H vs. an equivalent number of x3650 servers, there is an 18% price differential over five years. This becomes amplified if power costs increase over our — admittedly very inexpensive — 3 cents per kilowatt-hour, which is a typical price for a large NOC in the Midwest, where we tested this gear. In other parts of the country, power can be more expensive and subject to peak usage rates.

Other Implications

Servicing blades ultimately is faster than servicing rack servers for several reasons. First, the overall size and weight of a blade is easier to handle because its power supply is common to other components. We could pull a blade from a server in about 3 seconds, whereas pulling a rack server took more than a minute, even when cable management components were well designed and implemented. It would take much longer if a rack was in any state of disarray.

We measured how long, once a unit was out of a rack, it takes to change memory or a hard drive — the two components most frequently changed by a server administrator. In this case, the times were a wash. The time needed to reinsert equipment and bring a server back online was far faster with a blade server than with a rack server because no cables needed to be reconnected.

There is much to be said for how using blades reduces the number of power cables needed, as power cables are reduced from as many as 80 to eight. The number of copper or fiber Ethernet cables also is reduced dramatically, as well as the clutter that cables introduce and the air flow reduction that they represent.

Additional costs are associated with management components. In the case of the IBM servers we tested, we used IBM Director to manage both types. Director must be "housed" on its own rackable server or blade, and the server has its own set of costs, although it need not be a high performer with lots of storage. We downloaded various operating systems, including several instances running via EMC's VMware ESX, and configured them on the blade and rackable servers using Director. Some vendors charge per installation or per server for management components, and it's important to check how much these valuable and time-saving applications will cost.

Blade Limitations

The amount of onboard blade-server storage media is limited, a function of the small size of a blade and its heat dispersion needs. The blades we tested could have RAID configurations on them, but only a RAID 1 mirroring or RAID 0 nonredundant disk striping. This means that capacities are bound by the size of the drives ven-

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The rackable wiring quandary

BY TOM HENDERSON, NETWORK WORLD LAB ALLIANCE

Many data centers were designed to provide floor-based plenum cooling in an era when a 42U rack might have to dissipate just 3kW of server power. In such a rack, typically a maximum of 42U can be used, and a rack with 40 servers (with 2U reserved for Ethernet switches) means the power requirement must be made for 20kW — nearly seven times the load the data center may have been designed to both provide power for, and to cool.

In addition, 40U of rackable servers can mean a minimum of 40 power cables (double that number for redundant power sourcing, for a total of 80 power cables) and at minimum, 40 Ethernet cables (and the two-24-port or one-48 port Gigabit Ethernet switch needed to link them in a network). This produces a spaghetti-of-cables effect that can block some of the airflow needed to chill the cabinet adequately. While headless (meaning no monitor/keyboard/mouse) operation is typical, accessibility for each server becomes difficult in terms of requiring additional equipment (a ladder, as an example) to service a single rackable server.

The same design characteristic of older data centers also puts a certain ceiling on the number of blade servers that can be installed into a single rack, unless power and cooling components can be retrofit. IBM and third-party vendors such as APC, Emerson and Leibert offer substantial options to retrofit data centers to manage very high power loads at an additional capital/operational expenditure.

Some vendors have addressed the problem by offering over-sized racks with 45, 48 and custom unit size displacements. Rack depth is increasing to accommodate deeper chassis, both for blade servers and for rack-mounted systems. And highly articulate cooling schemes have also become available to aid front-to-back cooling, rather than using traditional floor-based chilled air plenums — so that heat dispersion can be focused for high cubic feet per minute chilling loads needed by blades, as well as other high-density chassis supporting routers, switches and VoIP gateway telephony components.

How we did it

We tested four types of IBM servers. An IBM blade chassis (BC-H) was used to house blades, and we mounted servers into our racks. We used a TED Model 1000 power meter that measures kilowatt-hours attached to a custom-built cabling plug and receptacle device to perform a 240VAC [volts in alternating current] split-phase measurement for the blade server chassis and a 120VAC single-phase measurement for the rackable units.

Measurements were taken directly from the equipment. We multiplied the counted kilowatts-per-hour measurement by 43,284 hours to obtain the number of kilowatt-hours the equipment would use over a five-year period including a single leap year.

We measured the performance of each server and blade running Windows 2003 Enterprise Server R2 and Red Hat Enterprise Linux 5 in default configurations (no optimizations were used). The blade servers and rack servers performed essentially identically and very well. One server, the x3650, had slightly better disk performance, we believe because of its RAID 5 configuration. Loads were spawned by scripts that simultaneously performed calculations of arrays, wrote to local storage (disks) and performed a secure FTP download.

THE FULL SPECIFICATIONS OF THE IBM SERVERS TESTED ARE AS FOLLOWS:

☐ BC-H Blade Center blade chassis (no blades, but including a 10GB Ethernet switch, 1GB Ethernet switch, four power supplies)

☐ HS21 blade, Model 8853 (two 2.0GHz Intel Quad Core CPUs, 1.333GHz front side bus (FSB), 8GB DDR2 memory, two 73GB serial-attached SCSI [SAS] drives)

☐ HS21 XM blade, Model 7995 (two 2.33GHz Intel Quad Core CPUs, 1.333GHz FSB, 16GB DDR2 memory, one 73GB SAS drive)

☐ x3650 Model 7979 (two 2.66GHz Intel Quad Core CPUs, 1.333GHz FSB, 8GB DDR2 memory, Server RAID host bus adapter, four 73GB SAS drives, two redundant power supplies)

☐ x3550 Model 7978 (1U two 2.66GHz Intel Quad Core CPUs, 1.333GHz FSB, 8GB DDR2 memory, Server RAID host bus adapter, two 73GB SAS drives, two redundant power supplies)

Servers

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dors ship with the blades, in this case, a limit of 288GB (maximum; we tested two 73GB drives in the blades) from IBM. Some will argue that 288GB is a lot, but it's a ceiling amount unless iSCSI, Fibre Channel or other SAN connection methods are onboard and well configured.

By contrast, the 2U x3650 can have a RAID 5 configuration internally by using four drives — three for RAID and one as a hot-spare. These drives, like those in blade-server housings, can be changed to accomodate larger storage needs, but it's unlikely that administrators will change drives once a unit is in service for a production application. With more native space available, rack-mounted servers have a higher denominator of native storage capability. Some vendors are putting this same storage capacity in 1U form-factor rackable servers as well. There's a tendency to not change components in a working system even if better components will achieve a longer application or service profile life.

The result is that blades need to connect to an external SAN if it's known or perceived that future storage-growth needs will exceed the amount of space available on the blade. For organizations that have SANs, blade-server attachments are well understood, and a variety of Fibre Channel SAN gear is available. If there's no SAN nearby, however, iSCSI can be used, subject to the bandwidth consumed over Ethernet connections by the virtualized iSCSI-based traffic.

It's also possible to put additional I/O cards into blades, as well as into rackables. The IBM line uses PCI and PCI Express (PCIe) cards in its rackables. Options to increase to two cards makes rackables more flexible in terms of I/O card expansion. The memory options in blades and rackables are similar.

Another potential disadvantage to blades is commitment. If you choose a blade-server vendor, your organization becomes captive to that vendor's service policies, component availability and service organization. This isn't necessarily the case for 1U deployments, because the 1U space can be occupied by any vendor, but a blade space will be occupied by a server from the chassis' manufacturer. Relationships become tighter if a blade environment is chosen.

Bottom Lines

Blade density represents a huge pool of computing power per cubic inch. Typically, four 9U IBM blade chassis will fit in a 42U rack with space to spare, which means almost 20,000 watts of power to cool. Forty x3550 rackable servers in the same rack use at most 75% of that wattage. There are 56 blades in this configuration, however, vs. 40 rackables inside a single rack, maximized in this way.

Performance was essentially the same between rackables and blades. Blades are easier to manage and service. We believe there's a vendor-captivity element to purchasing or deploying blade servers, as well as a decided limitation on local storage. However, in an organization with very good data center infrastructure, if you can live with the vendors as in-laws, you'll love the blades.

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CLEAR CHOICE TEST

Symantec's Enterprise Vault finds what you're looking for

E-mail archiving tool homes in on locating stored messages for compliance

BY JOEL SNYDER, NETWORK WORLD LAB ALLIANCE

Symantec's Enterprise Vault system provides e-mail and file archiving, regulatory compliance and legal-discovery features suitable for the enterprise.

In this exclusive test of Symantec's latest release, EV 7.0, we found the product provides a very deep set of search and recovery tools that can tap into information archived from a wide variety of sources.

With support for Microsoft Exchange and Lotus Domino, as well as any SMTP connection, EV can work with any enterprise mail system. In addition, support for archiving other information repositories across the enterprise, including shared file systems and Microsoft SharePoint services, gives EV the ability to pull data from an even wider field. EV is heavily linked into Microsoft Exchange clients, so we were also able to see benefits for users — including automated message archiving and deletion — tightly integrated into the Outlook e-mail client.

We did not test archiving performance but focused on the product's integration capabilities and its search and recovery features (see "How we did it" at www.nwdocfinder.com/9023).

In our tests using Exchange 2007, we focused on e-mail applications as the most likely and interesting data stores for enterprise IT. EV talks to Exchange in two ways. First, it can link into the journaling capability of Exchange to get a copy of every message that passes through your mail system. In Exchange 2007, Microsoft requires that all messages go through a messaging hub (even if they are passed between users in the same message store) and then provides a way for third-party applications, such as EV, to get copies of those messages as they fly by. We turned on journaling for Exchange 2007 on the messaging hub and verified that messages sent using an Exchange 2007 server were captured by EV according to policy.

EV gets the joke

One issue with any archiving and compliance system is that it's difficult to separate out the lunch dates from the confidential information. EV's Automatic Classification Engine (ACE) was designed to address this issue.

Each message entered into EV can be run past a set of classification rules such as looking for particular message characteristics (an MP3 attachment) or content (including looking for jokes). As a message matches different rules, tags can be attached that can be used within EV as part of a search.

ACE caught nine out of 10 jokes in our test, missing out only on a parody about cottage cheese. With that high catch rate, ACE could assist in both compliance and discovery tasks.

The second link to Exchange for EV is directly into each user's mailbox. When EV has its fingers deep into the mailbox, it can grab messages and move them to the vault, leaving behind a shortcut that will let the user get at the message moved to the EV message store. Once the message is controlled by EV, you can apply a range of retention policies, enforcing automatic deletion in the end.

Although the integration with Exchange is slick, we were concerned that moving messages out of Exchange and into EV trades off one storage nightmare for another. However, we found that EV can save message space in several ways. First, EV maintains "single instance" storage of messages even across different Exchange servers. This means you need a single larger storage system rather than a series of smaller ones, as in Exchange. Because EV is a "write mostly" type of application with a much lower transaction rate than an Exchange server, storage cost can be much lower. Second, because EV can operate across multiple journaling, compliance and archiving applications, you don't have copies of each message for each application.

Symantec also offers a tool kit of three applications (PST Locator, PST Collector and PST Migrator) to hunt down and archive personal mailboxes (.PST files) on individual's laptops and desktops across the enterprise. EV also can archive documents in public folders within Exchange, as well as on Windows file servers and Microsoft SharePoint servers.

One direct hook that EV doesn't have is into instant messaging. Although it has some support for linking to other IM-archiving systems, the document-based orientation of EV doesn't mesh well with the synchronous nature of IM traffic.

Some may buy EV for its retention enforcement tools and ability to offload messages from overloaded Exchange servers, but most will look at it to satisfy legal discovery and regulatory compliance. For users, EV offers a direct plug-in for Outlook that directly links to their archived messages, along with any other vaults they have permissions to see. This plug-in not only allows message searching, but can be used to move messages in and out of the vault. We found that the plug-in worked moderately well but not perfectly. Users on Exchange 2007 could not archive messages from their mailboxes, and one of our Exchange 2003 users couldn't always archive his own mail.

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Cons: Midmarket companies may find it difficult to scale down product for smaller deployments.

The Breakdown

Product capabilities and features **35%**	4.5
Management console and user interface **25%**	4.5
Interoperability **10%**	4
Scalability **20%**	4
Documentation **10%**	3.5
Total score	**4.25**

Scoring Key:
5: Exceptional.
4: Very good.
3: Average.
2: Below average.
1: Subpar or not available.

NETWORKWORLD BUYER'S GUIDES

Check out our E-mail Archiving Buyer's Guide www.nwdocfinder.com/1037

The search and navigation tool is available within a Web browser, with access privileges defined by the system manager. Both the Outlook plug-in and the Web-based tools preserve the folder hierarchy within Outlook. If you're looking for something in your mailbox or someone else's, you can get considerable hints based on how the messages are filed. A second Web-based search interface lets you search across multiple users and archive types, though you lose the ability to see metadata.

The other two search tools are specifically aimed at legal discovery and regulatory compliance. Discovery Accelerator goes beyond simply searching for messages and lets the researcher collect messages together as part of a case, put messages on "hold" (so they don't get deleted), export messages and documents, and manage the task of reviewing messages for relevance.

Compliance Accelerator serves a different purpose: setting aside a sample of messages from monitored employees for review. Compliance Accelerator has tools to define employees, departments and reviewers, and to set the sample size, as well as special "hot word" queries to add to the list of messages that must be reviewed.

Overall, EV 7.0 offers an outstanding, multifaceted, set of tools that can be used for e-mail retention enforcement, offline storage management, legal discovery and regulatory compliance. While it's always possible to make a good thing better, users of EV 7.0 will likely find that its capabilities will exceed their needs.

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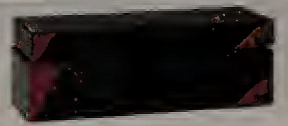

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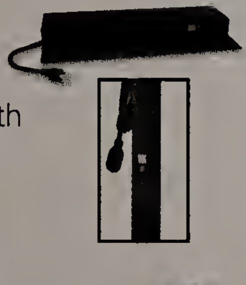

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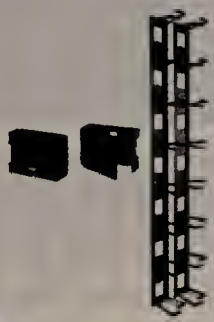

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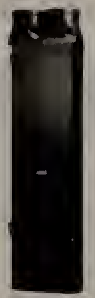

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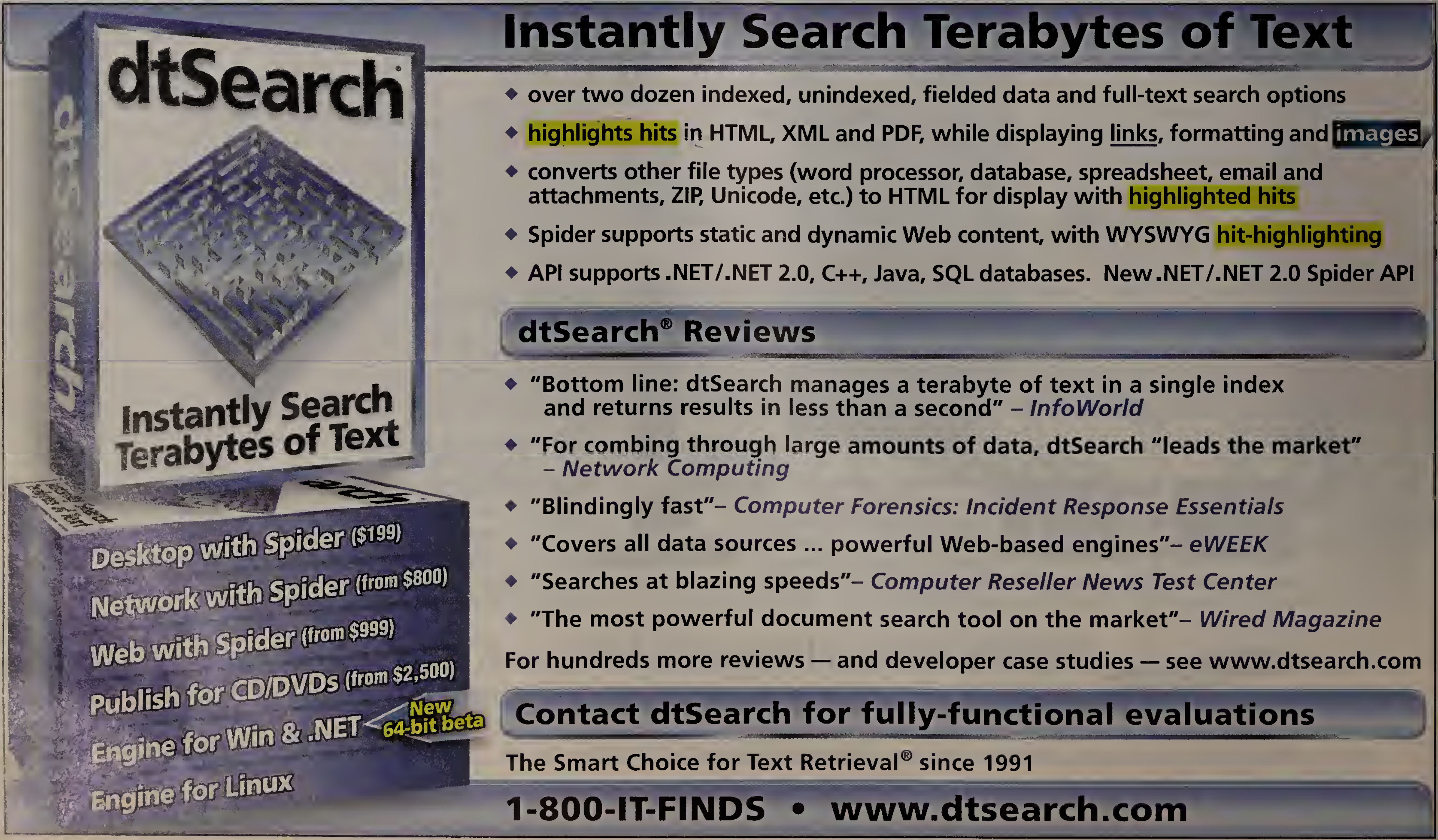

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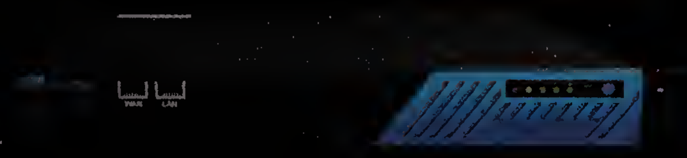

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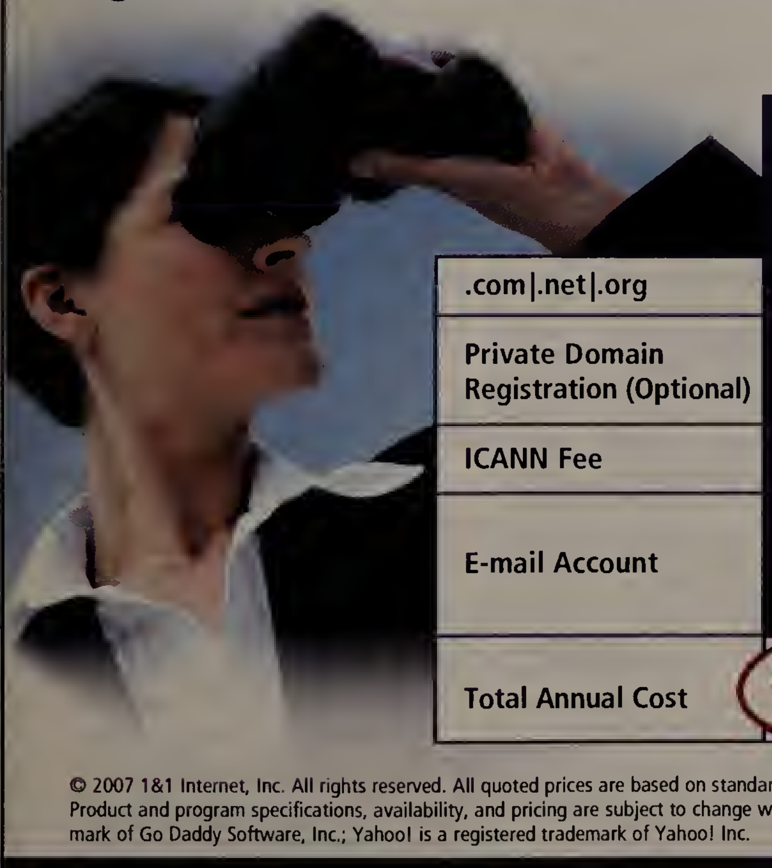

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Management

continued from page 1

Where things stand

Select network management tools offering IPv6 support:

Tool	Vendor	IPv6 status	Description
Adonis, Proteus Appliances	BlueCat Networks	Announced IPv6 support in March	DNS and DHCP devices support IPv4 and IPv6.
AppCritical	Apparent Networks	Due by June 2008	IPv6 support is under development for network management software.
CiscoWorks	Cisco	Supports IPv6	Campus management software can manage IPv6 Layer 2 and Layer 3 devices.
Cisco Network Analysis Module	Cisco	Supports IPv6	Blade that sits in Cisco switches reports on IPv6 traffic flows.
Cisco Network Registrar	Cisco	Supports IPv6	This DNS/DHCP service has offered IPv6 support for a year.
EMC Smarts IP Availability Manager	EMC	Extension for IPv6 is first step in IPv6 support	EMC is developing IPv6 support for Network Protocol Manager, Multicast Manager and MPLS Manager.
OpenView Network Node Manager	HP	Supports IPv6	Offers dynamic views for IPv6.
IBM Tivoli Network Manager	IBM	Due fourth quarter 2007	Will support IPv6/IPv4 dual-stack but not tunneling.
IBM Tivoli Netcool/Omnibus	IBM	Due fourth quarter 2007	Will support IPv6/IPv4 dual-stack but not tunneling.
NetMRI	Netcordia	Due by June 2008	IPv6 support under development for real-time network analytics appliance.
Observer	Network Instruments	Released with Version 12 in March	Implemented support for IPv6 across entire application in both software and appliances.
Sniffer Distributed & Portable	Network General	Due in 2007	IPv6 enhancements will be available in all products, limited IPv6 support already available.
SolidDNS	InfoWeapons	Added IPv6 support last fall	First DNS appliance to support IPv4 and IPv6 running in dual-stack mode.
Windows Server 2008 DHCP	Microsoft	Supports IPv6	Supports stateless and stateful configuration.

management software to handle IPv6 leaves networks that are moving to the new standard vulnerable to attack.

With new technology like IPv6, "you're much more vulnerable to attacks or to malicious attempts to disrupt your network, and the ability to analyze those attacks when they happen is really important," he says.

Experts say the need for network monitoring and management tools for IPv6 is greater than tools for today's IPv4 networks for several reasons:

- Networks will become more complicated because they will run IPv4 and IPv6 side by side for years during the transition from one standard to the other.
- IPv6 lets network managers directly address more network devices than ever before, which will lead to larger networks.
- IPv6 addresses are longer and more cumbersome to display and store in network management applications.
- IPv6 packet headers are larger, and there are more of them, which is a challenge for network management and monitoring tools.
- New IPv6 features, such as end-to-end security, will make it harder to monitor packets for network traffic analysis.

That's why it's critical that network managers have tools to monitor and manage IPv6 devices and traffic, to analyze both network protocols, and to help with troubleshooting.

"We believe that both security and management have to be top-of-mind in any customer transition to IPv6," says Dave West, director of field operations for Cisco's Federal Center of Excellence. "You have to be able to manage devices and visualize the flows."

The tools to do this aren't available today, and it's unclear whether enough IPv6-ready network-management functions will be available by June 2008, when U.S. federal agencies are required to turn on IPv6 support in their backbone networks.

Network management applications for IPv6 are "still in the development phase," says Yanick Pouffary, technology director for the North American IPv6 Task Force and an IPv6 Forum fellow. "Everybody is targeting the federal agencies and the timeline that is in the Office of Management and Budget mandate."

"You're not going to find IPv4-to-IPv6 parity if you look across the board in network management," Cisco's West says. "We have some features now, and other value-added features will come in time."

West expects "management capabilities will mature as more devices come online to support IPv6."

If these tools don't become available soon, network managers run the risk of having to do twice the work to support IPv4 and IPv6 in dual-stack networks.

"It'll be harder in the sense that you have two protocols to look over," Summerhill says. "But if management systems come along that are capable of doing dual-stack, it won't be that much harder."

Network managers will need IPv6-enabled management tools for DNS, address management, traffic generation, traffic analysis, troubleshooting and application-performance monitoring, to name a few management tasks.

These tools must support the whole family of IPv6-related protocols created by the IETF, including Neighbor Discovery, a messaging protocol for discovering neighboring devices that also aids local connectivity, routing and configuration.

"Network management tools will need to embrace the IPv6 protocols like Neighbor Discovery to be able to manage the devices," Pouffary says. "The network appliance needs to be on an operating system that understands IPv6, and you have to make sure that your software calls up IPv6 data structures. . . . The bulk of the work for network tools is how to display that information. They'll need [GUI] changes."

Pouffary says network management tools need to be upgraded to provide an integrated view of IPv4 and IPv6 devices and traffic. "You want a view of all of your network that is integrated, so network managers can react to threats and manage devices regardless of whether they are running IPv4 or IPv6," she says.

Pouffary says it's important for network managers to make sure the policies they have for accessing network resources in IPv4 are applied to IPv6 with its autoconfiguration feature and end-to-end security model.

"The products that enforce your policies need to understand that you have IPv6 devices on your network," she says.

Network management applications will need to support IPv4 and IPv6 together in dual-stack mode, which is the most common type of deployment. Another important feature is tunneling, which lets IPv6 traffic move over an IPv4 connection or vice versa.

"You need to be able to query an IPv6 device over an IPv4 connection," Pouffary says. "You need to be able to speak the language of the device that you are talking to and also understand the transport plane."

Commercial network-management packages are adding support for IPv6, but it often is limited to a few key features required for initial deployment. Even open source tools fail to provide full-fledged IPv6 support.

"There are quite a few tools that we use for IPv4 that do not support IPv6," says Matt Davy, chief network architect for Indiana University in Bloomington.

Davy says the university's legacy Juniper firewalls, as well as its open source Snort and Bro intrusion-detection systems, don't provide thorough enough support for IPv6.

"They have some IPv6 support, but it's not very good," Davy says. "The tools that we use to monitor the network, seeing the state of what's up and what's down, are mostly open source and things that we developed, but they don't have support for IPv6."

Davy says the situation is a "pretty big problem. We have IPv6 deployed pervasively. We have 80,000 data jacks that are IPv6-enabled, and we don't really have enough visibility into the traffic."

Davy says the university is attacking the problem by upgrading to newer Juniper firewalls and intrusion-detection software with support for IPv6.

"It's a process of replacing equipment with new equipment that supports IPv6 and updating the tools we've developed to support it as well," he says. ■

■ **Network World**, 118 Turnpike Road, Southborough, MA 01772-9108, (508) 460-3333.

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BACKSPIN Mark Gibbs

Appalled by things legal

A couple of weeks ago in this space I was Astounded by Things Legal. Well, the legal fun never seems to stop.

Following last week's BackSpin segment on Ameritrade's customer data leaks, Art Medlar, from whom I originally heard about the issue, dropped me a note: "Just got a call from ... the Ameritrade privacy department. No new information, but it seems like someone there read *Network World* and Slashdot. Also, it sounded like they're pretty seriously concerned ... they're pretty certain that while some addresses are leaking out, not all of them are; possibly far from all of them."

Interesting. So, Medlar was one of the unlucky few. I hope Ameritrade is really taking this seriously, because leaking even a single customer address is an appalling breach of trust. I wonder whether Ameritrade will formally notify Art, as the law requires?

Another previous BackSpin topic that has been updated is the Julie Amero case (also mentioned last week). The latest news is that a Superior Court judge overturned Amero's January conviction of four counts of risk of injury to a minor, which could have carried a 40-year jail sentence and ordered a new trial. (She didn't force-feed them crack or beat them with a baseball bat — this is all over out-of-control porn popups on a PC!)

When Amero is found not guilty, I sincerely hope she will sue the school where she worked for negligence or whatever they can be sued for, as well as the assistant state's attorney, David Smith, for whatever the correct legal term is for being a shortcut-taking, careless lawyer who doesn't give a damn about justice. If ever there was justification for massive compensation to be awarded, this case is it.

My final appointment with appallment is over another topic that won't die: As you may recall, Sam Peterson II was charged under a 1979 antihacking statute for "unauthorized use of computer access" when he was caught using an unencrypted Wi-Fi service without authorization.

Peterson had frequently parked near the Reunion Street Café at lunchtime and got out his laptop to check his e-mail. One unlucky day the chief of police in Sparta, Mich., stopped to ask him what he was doing. Peterson innocently told him. Bad move: Did you know that you never have to tell the police what you're doing? If there's a real problem, they'll let you know, but if they are just fishing, you should stay quiet. Anyway, the chief went away, researched the law and decided to prosecute.

I wrote in my previous column that, according to the nice lady at the Sparta Police Department, the café owner, Donna May, had pressed charges. When I tried to speak to May, she wasn't available. She returned my call a couple of days ago to tell me she did not press charges and didn't care if Peterson, or anyone else, used her Wi-Fi service. She told me that anyone is more than welcome to use her Wi-Fi, though she would prefer that people ask first.

May also told me that the chief questioned Peterson because a lady barber in the Varsity Barber Shop had noticed Peterson repeatedly sitting outside and notified the police of someone loitering. This sounds very odd.

May also told me that the police later caught another man doing the same thing and called her. She asked to speak to him and told him that he should say he'd used the café restroom and asked her if he could use her Wi-Fi from his car. The man told this to the policeman, who was, according to May, rather annoyed and said that they wouldn't refer such cases to May in the future. May replied that would be fine, as they hadn't done so before.

So it appears that the Sparta police are capitalizing on this ridiculous Michigan law and trolling for people to prosecute with the complicity of the local prosecutor. This is insane and shameful. If May doesn't care, then tell me, where's the harm being done other than to the poor bastards who get snagged for the high-tech equivalent of jaywalking and wind up with a police record?

More fun? Spill the beans to backspin@gibbs.com or on Gibbsblog..

Paul McNamara

NETBUZZ News, insights and oddities

Readers get their turn on the soapbox

It's been so long since we've dipped into the mailbag that I can't even lift the thing. What follows are a few choice pieces:

My favorite recent missive comes in response to an item about a social-engineering experiment that saw 409 individuals out of some 250,000 click on a Google ad that read: "Drive-By Download ... Is your PC virus-free? ... Get it infected here!" Much scorn was heaped upon the 409. Reader John Huie is more understanding:

"I'm shocked that more people didn't click on it," he writes. "When I was a kid, my dad (who worked in electronics) built a little black box out of plastic. It was about 5 inches tall and maybe 3 inches wide and deep. It was completely sealed so that it couldn't be opened.

"On top was a little red button that was labeled 'Do not press.' If someone pressed the button, it would begin beeping loudly, and there was no way to turn it off unless you put a magnet up to the bottom.

"He would put this thing in the bathroom in a drawer, or under the sink, or in the medicine cabinet. It was amazing how many times guests would come over to the house and go to use the restroom, and then we would hear this beeping coming from in there. . . . People are curious."

My recent rant about a spate of outages suffered at the hands of Verizon FiOS TV brought this contribution from a fellow who asked that he remain anonymous because he was once involved in a FiOS rollout and still does work for Verizon:

"I am not surprised there are issues [with FiOS TV]. They go deeper than the outages you experienced," he writes. "The FiOS project was a marketing initiative. They controlled the time line and the budget. Marketing did not understand the complexities of integrating cable systems with their own proprietary telephony systems or the differing regulatory requirements.

"Some business units were virtually excluded from the process. IT was given very little input into the decision-making process and when they did, they made very hurried decisions without sufficient research.

"Verizon will continue to throw money at the system until it is stable, but their bureaucracy and lack of decision makers with a view of the big picture will make this process much more expensive than it needs to be. Verizon is a good company. They have just grown their bureaucracy and become so inbred, they are not very innovative."

Another reader offered his view as a Verizon customer, who would appreciate a more personal variety of service.

"Wow, you actually got to speak to a real individual at Verizon!" writes Ed Jenkins. "My voice-recognition customer service representative would be jealous!"

In writing about a study by the Centers for Disease Control that shows more people ditching their landlines to go mobile-only, I asked "what a telephone-usage study has to do with disease control and prevention." It was not meant as a serious question, but a number of readers offered serious answers:

"Quite some time ago I took part in a CDC study about cell phone use in rural healthcare environments," writes Howard Stewart. "Some of the CDC concerns were with public health alert notifications and the effectiveness of 911 in a cellular environment. In our area the all-mobile scenario is still rare. . . . So the CDC is trying to get a handle on the wireless world and what changes they need to advocate to take advantage of technology and changes in communication practices."

Finally, we have a reply to an item about Microsoft taking heat yet again — this time from a user who ignored an explicit warning when installing a BIOS . . . and then wanted to blame Microsoft for the trouble that ensued.

"It's nobody's fault but the user," Jim Lloyd writes. "And we need to quit blaming Microsoft for everything that happens to us, period. I am not a big fan of their practices but this is ridiculous."

Feel free to send more now that there's room in the box. The address is buzz@nww.com.


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